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T. H. Sauter, city engineer of the month, has seen his community of Cuyahoga Falls, O., and its problems grow mightily. More on page 26.

GALION 503
Tandem Drive ECONOMY GRADER

– Gets Jobs Done in "BIG GRADER" Style!

– At a New Low in FIRST COST and OPERATING COST !

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FEATURES

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- Gasoline engine – 40 h.p.
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- Weight – 8720 lbs. (without extras).
- Front tires 6.00-20, rear tires 7.50-20; larger sizes available.
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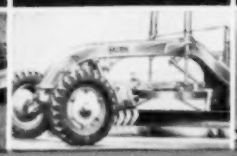
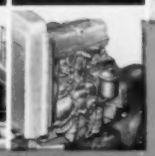


36.7 H.P. DIESEL ENGINE



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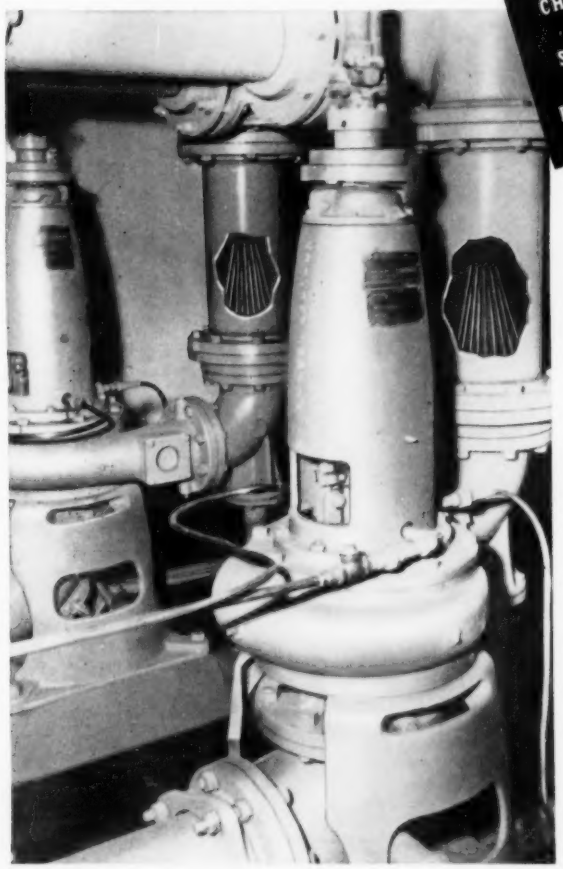


CHICAGO SEWAGE EQUIPMENT

FLUSH-KLEEN Sewage Ejectors

More than 12,000 installed in lift stations, buildings and ships

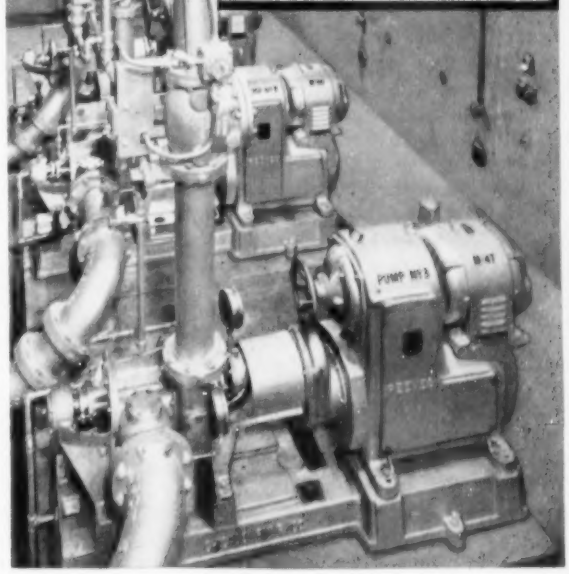
Flush-Kleens can't clog because rags never reach the impeller. Specially designed strainers in the discharge line retain all coarse matter. Sewage flows over the strainer and through one of the pumps to the wet well. When the pumps operate alternately they pump only strained sewage. No rags or coarse material ever pass through the pump casing. Each strainer is automatically flushed clean during its pumping cycle.

One of 11 Flush-Kleen Lift Stations installed in the City of Portland, Oregon. The discharge line has been cut away to show the strainer. These stations were designed by Stevens and Koon for the Engineers Portland Sewerage Project.

CHICAGO SEWAGE EQUIPMENT

SCRU-PELLER Sludge Pumps

OVER 8,000 IN SERVICE



Scru-Peller Pumps are designed specifically for pumping primary sludge, are positive in operation and truly clog-proof.

Continuous multiple shearing action is provided by stellited cutting edges of the screw and eight stellited cutting bars positioned in the screw and pump housings.

Heavy-duty ball bearings at each end of the screw and impeller shaft eliminate strain and vibration, permitting pump to withstand sudden and severe overload shocks.

Three of the 27 Scru-Peller Pumps installed at the Hyperion Sewage Treatment Plant, Los Angeles, California. Board of Public Works and Metcalf & Eddy, Engineers.

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SEWAGE EQUIPMENT DIVISION

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KEITH COUNTY
compared equipment

—now it's 95% CATERPILLAR!

A Cat No. 12 Motor Grader and a No. 12 with Domor elevating grader team up to elevate and grade a Keith County road preparatory to graveling. Keith's equipment line-up is 95% Caterpillar, including three D7s with bulldozers, one No. 70 Scraper, five No. 12 Motor Graders, a No. 112 Motor Grader, an HT4 Shovel and two No. 12s with Domor elevating graders.

Taxpayers in Keith County, Nebraska, can be sure they're getting their money's worth from their equipment. Their officials *compare* before buying—the best way to get the best machines for any job. Here's what Swan Monson, county commissioner, District No. 1, says:

"I've been commissioner for 13 years. Since I compared them with competitive equipment, I've always used Caterpillar machines. Now this county is 95% Cat-powered. I had a D7 that had worked for 12 years and was still going strong when it was traded in. I had a No. 12 with 14,000 hours with a minimum of down time. The service behind these machines is excellent."

You're looking at two of Keith County's No. 12s in action—one with a Domor elevating grader. The county has seven No. 12s in all and uses them all year round. What makes them standouts for performance? There are lots of reasons—here are some: Only Caterpillar gives you a grader with true *balance* in power, weight and speed. The No. 12's Cat* Diesel Engine delivers its full rated 100 HP—even on low-cost No. 2 furnace oil. For maximum traction, weight is concentrated over tandem drive wheels. And working speeds range from 2.3 to 19.3 m.p.h. through smooth-shifting, constant-mesh transmission.

More reasons! Visibility that gives full view of blade and job from the operator's seat, anti-creep controls that "stay put" under loads and vibration, and a wide range of blade positions without leaving platform and without manually changing blade or lift links. All these and other features add up to more work at lower cost with less down time than any competitive unit!

99 out of every 100 Caterpillar Motor Graders ever built are still on the job. Your Caterpillar Dealer, nearby for service and information, will be glad to show you how these big yellow machines can do more work at less cost for you. Ask for a demonstration!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

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PUBLIC WORKS MAGAZINE

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THE MOST USEFUL ENGINEERING MAGAZINE FOR CITIES, COUNTIES AND STATES

Versatile Tractor Shovel Disposes of Garbage, Handles Other Jobs for Evansville, Wis.

by **BRADEN E. WOLFF**
Superintendent of Streets, Evansville, Wis.

The HD-5G Tractor Shovel with 1-yd. bucket spreads refuse in old gravel pit, which was previously a dangerous menace.

Like thousands of other towns, we must buy equipment that can handle a wide range of jobs, because we operate on a limited budget and often cannot justify the purchase of a machine just to handle a certain job. The equipment versatility we seek is typified by an Allis-Chalmers HD-5G, 1-yd. Tractor Shovel, which we bought primarily for garbage and rubbish disposal but which we use for other jobs, too.

The Sanitary Landfill system of disposal is used in our town because of its economy, safety and benefit in recovering otherwise useless land. Refuse is picked up by a 10-yd. garbage truck and an open truck, and is hauled to an old gravel pit covering about three acres on the edge of town. The tractor shovel spreads the material, compacts it by traveling over it and then covers the refuse with dirt or sand. The landfill can be built up in successive layers until the level is the same as that of surrounding land. Cover material consists of street sweepings, discarded foundry sand, and overburden from a sand pit adjacent to the landfill.

It is estimated the old pit now being used will provide disposal capacity for three or four years. When filled, this one-time menace will be used for a playground. There are other pits nearby that also will be put to such double use — first a means of refuse disposal, then a site for healthful playgrounds for the community. Needless to say, citizens and town officials are very happy with the new system.

We find that our collection equipment can handle Sanitary Landfill operations efficiently in a total of two days a week. The remainder of the time, the tractor shovel is available for sidewalk and street work. It is used for both construction and maintenance, as well as stockpiling, loading — in fact, any jobs there are to be done. It either travels from job to job by its own power or is hauled on a trailer behind one of the trucks.

★ ★ ★

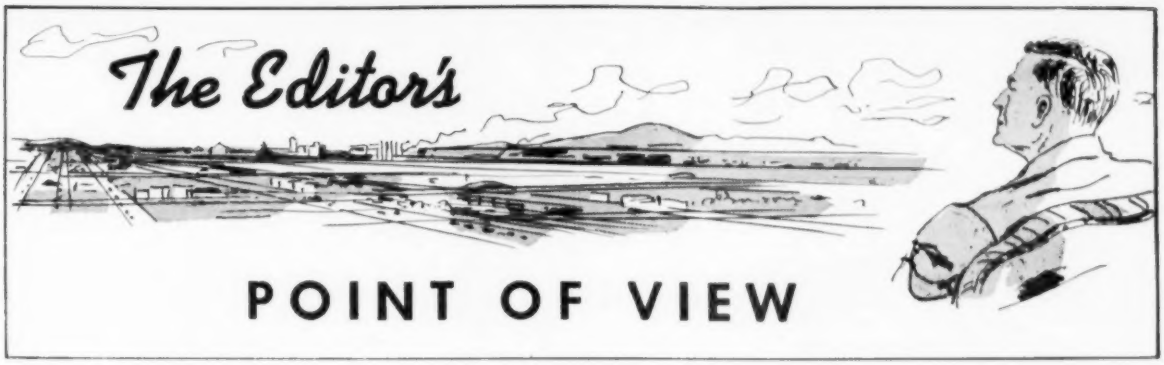
Counties, cities and towns throughout the country are finding Allis-Chalmers Tractor Shovels the ideal machines for all-round work. They are always busy because they do so many jobs so well. Usefulness is further widened by a variety of quick-change attachments for the HD-5G, including 2-yd. bucket for snow, coal and other light materials; trench-hoe for digging trenches and foundations; blades for dozing; and rear-mounted scarifier for breaking up old surfacing and for more efficient excavating.

See the HD-5G and the three larger size tractor shovels at your Allis-Chalmers dealer's. Let him show what they can do on *your* job.

After packing material well with its 16,200 lb. of weight, the tractor shovel carries fill from nearby pile and spreads it to completely cover refuse.

Portion of pit in foreground has already been filled to level of surrounding land. Pit in background is yet to be filled. Land will be used as a playground as it is filled in.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



An Appreciation to the AWWA

THE RECENT convention of the American Water Works Association in Seattle was one of the best that we can recall, and congratulations are due to those responsible for it, both national and local. The special train to the convention left nothing to be desired in thoughtful precision and careful arrangements. The planning in Seattle was of the highest order; the program fine; and the exhibits in full keeping with the high level of the other events.

If Winter Comes—And It Always Has in the Past

WINTER usually does come, and in preparation for it we shall publish next month a number of articles on "Getting Ready for Winter." Cold weather normally makes one think of snow plows, ice control and anti-freeze in the automobile radiator; but it has implications considerably beyond those unwelcome concomitants. Water departments have many things to do if they are to continue to serve all of their customers, come zero or deep snow; and even sewage treatment plants have winter problems, not to mention sanitary fills for refuse disposal. We have tried to combine in our articles a happy blend of past experience and forward-looking planning. We don't like winter, but like everyone else in these northern states we are looking forward to being able to meet it on relatively advantageous terms.

The Costliest Piece of Equipment in the Public Works Field

TO THOSE brought up under the construction methods of a generation ago, it may come as a shock to realize that the costliest piece of equipment on a job is probably the pick and shovel combination. There are, of course, a few places on every job where this kind of equipment—and its human motive power—must be used; but manpower costs too much to-day, and is too scarce as well, to do more than the barest minimum of work in this way. The developments in cost and labor saving—the terms are to-day synonymous—equipment have been outstanding over the past few years. As a result, the city, county and state which has invested even reasonably in such tools over the past few years, can carry on its maintenance and construction activities without excessive financial burden. Public Works Magazine has long recognized this condition and has continually called to the attention of its readers, and urged the purchase of, the best and most modern equipment. It will continue to do this because it feels that, in no other way, can our governmental units perform their functions of service to their citizens. There is a tremendous backlog of work that needs to be done—more highways and streets, waste collection and disposal, water supply and treatment, and refuse collection and disposal, to mention but a few. And each new construction project must be adequately maintained and operated if it is to return a profit on its cost. Increasing mechanization is, we think, the only answer.

Cooperation Between Railway and Highway Transportation

WAITING for the New Haven to Boston at Grand Central recently we heard the announcer say, "The Yankee Clipper for Boston, stopping at New Haven, New London, Providence, Back Bay and also at Route 128". The last statement puzzled us but we found the answer.

Route 128 is the new circumferential highway around Boston, and the New Haven has built a temporary station and an extensive parking area and named the new station Route 128. Even the crack express trains stop there. Thus the resident of the Boston suburban area can park his car at the Route 128 station and on his return reach his house without passing through the Boston metropolitan district. Several people on the train from New York were doing just that. The New Haven plans to build a new permanent station there to replace the present temporary one.

Everyone gains by this arrangement. Some traffic is diverted from the congested area, motorists have an easier time reaching the railroad and some additional people use the train for part of their journey rather than traveling all the way by car.

CRACKER BARREL

...CIRCA '54

Your radio becomes a listening post at the crossroads of the world . . . every week . . . when Fairbanks-Morse, in cooperation with the editors of *Nation's Business*, brings you an authoritative roundup of the news events most important to everyone's business.

Today, more than ever before, it is to your advantage to keep informed . . . and here is a factual summary presented in a form which better enables you to make the judgments necessary to your business. Be sure you tune in *this week* to the "Nation's Business." See the table at the right for local station and time. Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois.

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Beloit, Wis.	WGEZ	7:45 Mon.
Birmingham, Ala.	WBRC	6:15 Mon.
Boston, Mass.	WBZ	8:00 Tues.
Buffalo, N. Y.	WBEN	7:00 Mon.
Charlotte, N. C.	WBT	7:30 Mon.
Chicago, Ill.	WGN	8:05 Mon.
Cincinnati, Ohio	WLW	7:00 Mon.
Cleveland, Ohio	WGAR	7:30 Mon.
Columbus, Ohio	WHKC	6:45 Mon.
Dallas, Texas	KRLD	6:30 Mon.
Davenport, Iowa	WOC	6:15 Mon.
Denver, Colo.	KOA	8:30 Mon.
Des Moines, Iowa	WHO	7:15 Tues.
Detroit, Mich.	WWJ	6:45 Mon.
Duluth, Minn.	WDSM	8:15 Mon.
Freeport, Ill.	WFRL	4:15 Mon.
Houston, Tex.	KXYZ	7:00 Tues.
Indianapolis, Ind.	WFBM	6:15 Mon.
Jacksonville, Fla.	WJAX	7:15 Mon.
Kansas City, Mo.	WDAF	6:15 Mon.
Knoxville, Tenn.	WNOX	6:30 Tues.
Los Angeles, Calif.	KFI	7:45 Mon.
Louisville, Ky.	WHAS	6:30 Mon.
Memphis, Tenn.	WMPS	6:30 Mon.
Milwaukee, Wis.	WCAN	7:15 Mon.
New Orleans, La.	WWL	6:30 Mon.
New York, N. Y.	WOR	9:05 Tues.
Omaha, Nebr.	KFAB	6:30 Mon.
Philadelphia, Pa.	WCAU	7:30 Mon.
Pittsburgh, Pa.	KDKA	6:30 Tues.
Pomona, Calif.	KPMO	6:15 Mon.
Portland, Oregon	KGW	6:45 Mon.
Providence, R. I.	WPRO	6:29 Mon.
St. Johnsbury, Vt.	WTWN	7:15 Mon.
St. Louis, Mo.	KSD	7:15 Tues.
St. Paul, Minn.	KSTP	6:15 Mon.
Salt Lake City, Utah	KSL	7:30 Tues.
San Francisco, Calif.	KCBS	7:00 Mon.
Seattle, Wash.	KOMO	6:45 Mon.
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PREFERS

Concrete Pressure Pipe

The District of Columbia, home of the Nation's capitol, recognizes the advantages of concrete pressure pipe. From 1925 to the present, over 175,000 feet of concrete pressure pipe have been installed in this congested 69 square mile area. Pipe diameters range from 20″ to 78″, with heads from 70 up to 450 feet. A substantial part of this footage is in use in the Washington, D. C. distribution system.

Washington engineers consider economy and length of service of primary importance when specifying water pipe . . . also, high carrying capacity, and ease of installation. Because concrete pressure pipe meets these and other exacting requirements, it has been selected time and again for new supply mains and extensions to the distribution lines.

If your community is planning additional water lines, or replacements for old lines, check into the advantages of concrete pressure pipe. It is available in sizes from 12″ to over 12′ in diameter, for high or low heads, and can be installed to fit your individual requirements.

Member companies are equipped to manufacture and furnish concrete pressure pipe in accordance with established national specifications and standards.

Concrete PRESSURE Pipe

AMERICAN CONCRETE PRESSURE PIPE ASSOCIATION
228 North LaSalle Street
Chicago 1, Illinois

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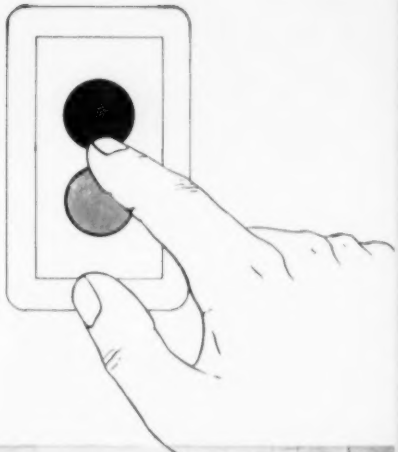
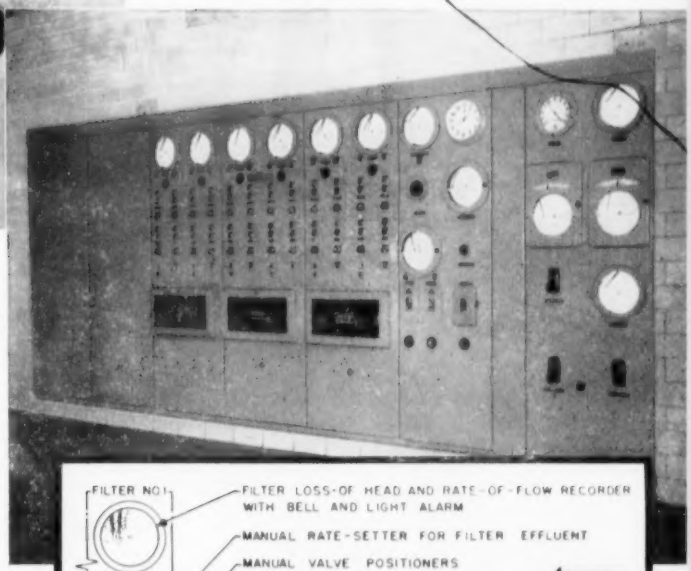
HOW BUILDERS *AUTO-CENTRAL* FILTER CONTROL REDUCES COSTS...



▲ Aldrich Purification Units and Filters at Alexandria plant of American Water Works Service Company.

Central control panel in pump and chemical feed building. From this board, the filter effluent and backwash rates are remotely controlled by means of Builders Auto-Central Control. ▶



The same type of automatic time-sequence operation which has won such wide acceptance for automatic home washing machines now comes to the modern water works. Here is one of the first installations of Builders Auto-Central (automatic-centralized) filter Control, proven by over three years of successful operation at the Alexandria Water Company in Alexandria, Va.

Builders Auto-Central Control has many advantages: It saves time — relieves plant personnel for other duties. It eliminates supervisory headaches. It insures accurate backwash rates, proper washing times, and helps to maintain maximum filter efficiency. It reduces construction costs by eliminating the need for shelter over conventional operating tables.

Here's how Builders Auto-Central Control backwashes a filter: A Builders Loss-of-Head Gauge signals the need for filter backwashing. The pumping station operator (there's only one per shift!) pushes a button which starts the backwash cycle for the proper filter. The Sequence Controller and Pneumatic-Hydraulic Valve Positioners then complete the washing cycle step by step, and return the filter to normal operation TOTALLY UNATTENDED.

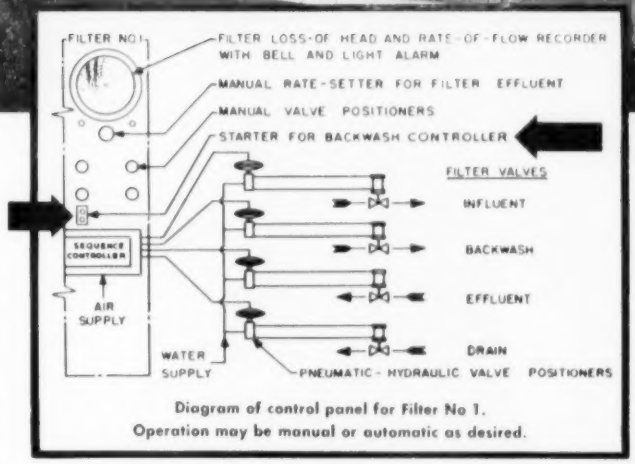


Diagram of control panel for Filter No 1.
Operation may be manual or automatic as desired.

Auto-Central Filter Control is another example of Builders' pioneering in the water works field. For complete details on this or other types of Builders Water Works Equipment, write Builders-Providence, Inc. (Division of B-I-F Industries, Inc.), 356 Harris Ave., Providence 1, R. I.

BUILDERS-PROVIDENCE

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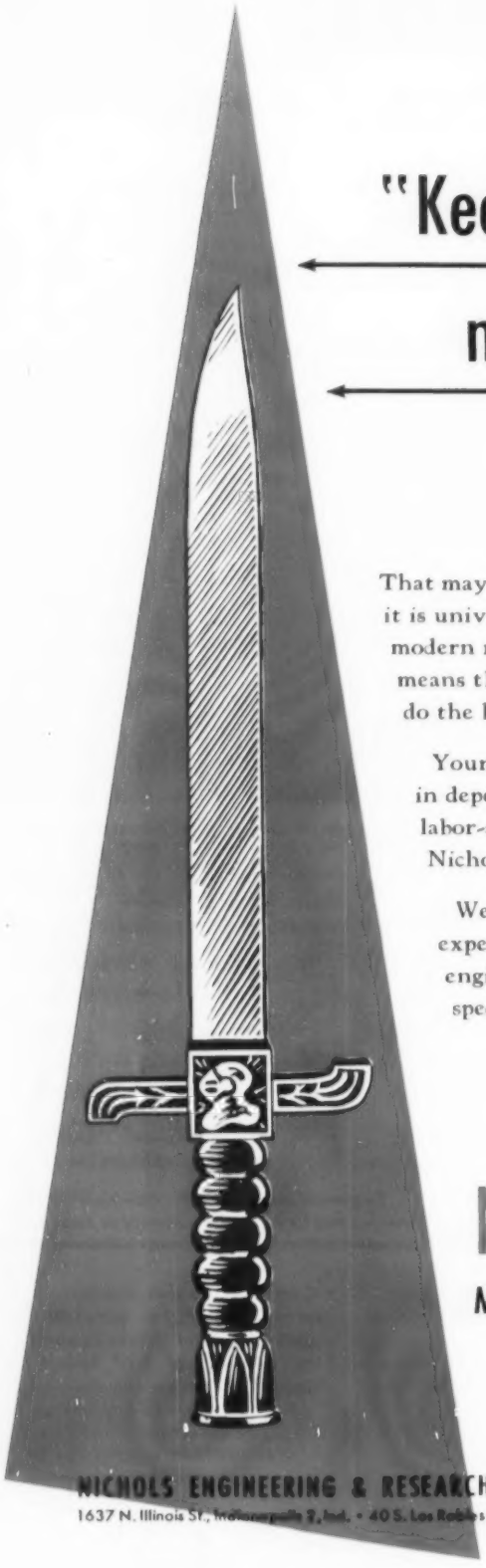
BUILDERS IRON FOUNDRY • PROPORTIONEERS • OMEGA MACHINE CO.

BIF METERS FEEDERS CONTROLS

Now's the time to mail this month's Readers' Service card.



"Keener blade makes cleaner cut"

That may or may not be an old Chinese proverb, but it is universally true, even when applied to modern refuse disposal, because it means that it takes the finest equipment to do the best job.

Your community deserves the best in economy, in dependable performance, in modern labor-saving incinerator design . . . the Nichols Monohearth refuse incinerator.

We invite you to consult with the experienced staff of Nichols incineration engineers or write for more specific information.

Nichols Monohearth

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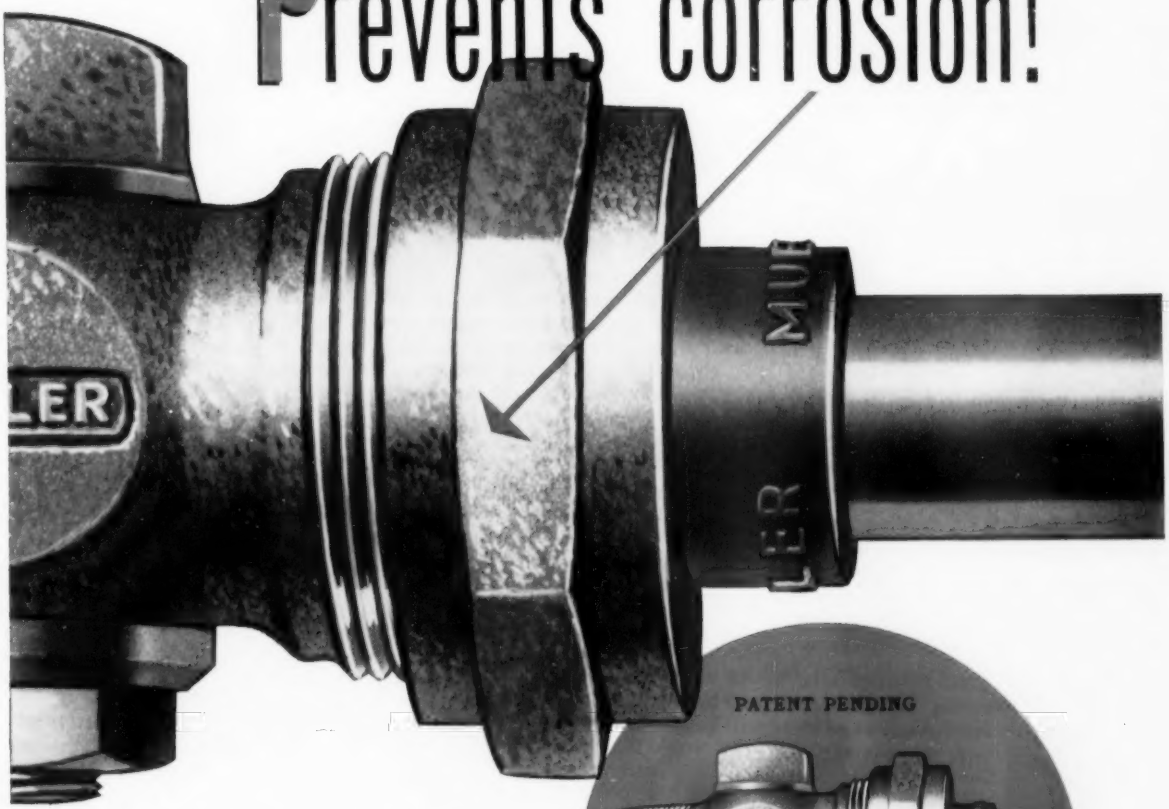

use this Corporation Stop with Insulating Coupling Outlet!

Designed for a specific need, this Corporation Stop with Insulating Coupling Outlet minimizes electrolytic action and subsequent corrosion by completely insulating copper service lines from the main.

The Insulating Outlet Corporation Stop is easily installed in the main, under pressure, with the Mueller "B" Machine. Copper service pipe is flared with standard tools to prevent pull-out. Coupling needs only minimum tightening for a perfect seal.

Contact your Mueller Representative or write direct for details.

MUELLER CO.

Dependable Since 1857

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It's a fact . . . our handy Readers' Service card is the way to get new catalogs.

Your Best Generator Buy—

WINCO

With SUPERCHARGED Power

When you buy an engine-generator, you're buying power to run tools and floodlights wherever they're needed. That's why a generator that delivers MORE POWER PER POUND is your best buy. That's why Winco's new lightweight generators with SUPERCHARGED power are your best buy.

These new plants, both AC and DC, only weigh 148 lbs. for easy carrying, and they're packed with bonus power that keeps tools going at full efficiency. What's more you get these job-proven WINCO advantages:

SUPERIOR BELTED CONSTRUCTION — lets engine operate at its most efficient speed. Engine and generator are separate for fast service. Belt adjusts in seconds.

EASY-TO-START 4-CYCLE ENGINES—either Wisconsin AKN or Briggs & Stratton #14. Parts, stocks and service readily available.

MULTIPLE USE CONTROL PANEL — four 115V, two-wire twistlock receptacles. Use four tools at once.

F-2500 DC—2500 watts starting capacity and continuous output* (with Wisconsin AKN). Compound wiring for SUPERCHARGED power.

F-3000 AC—2000 watts continuous output, bonus starting capacity of 3000 watts*, 115V, single phase, 60 cycle.

*Ratings determined at sea level and 60° F. ambient temp.

Complete line of Engine-Generators—300 watts to 10 KW.

Get all the facts on Winco's SUPERCHARGED power and how it will do a better job for you. Send this coupon today to:

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SIOUX CITY 2, IOWA

Send me the facts on Winco's new lightweight carryable generators with SUPERCHARGED power.

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Subsidiary of ZENITH Radio Corporation

People, Ideas and Events

BY "DOC" SYMONS

H. T. M. A. — And here it is the month when mid-west farmers look to see if the corn is knee-high by the Fourth of July.

Most of you know that I hail from Illinois and that great University, located (we used to say) in the heart of the great corn desert.—About this time I grow nostalgic about those cornfields, planted "on the square" for mile after mile.

And this is the season of the year when water works men, as well as farmers, cast an anxious eye toward the heavens, with a hopeful prayer for rain.—As I write this item in late May, New York City's reservoirs are not yet full and consumers have been asked to curtail water usage and cut down waste. But Ed Clark, Chief Engr. of N.Y.C. Water Supply, tells me that there is no need to use the Hudson River supply because the new reservoirs are now filling and by the end of the summer there will be plenty of water. Ed, incidentally, would like to have the multiple dwellings metered in New York, but I guess the political powers don't go along with the idea.—Oh Me!!

★ ★ ★

Luminous Quote — "If your efforts are criticized, you must have done something worth while."—Anonymous.

★ ★ ★

In mid-May I journeyed to Cornell University to give a talk on Sanitary Engineering before the Ithaca Section of A.S.C.E. In my comments I mentioned that "Sanitary Engineering deals with clean and dirty water and their relation to human endeavors. In particular, sanitary engineers are concerned with the design, construction and operation of water supply, sewage disposal and industrial waste treatment facilities."

During my comments I said that ordinary civil engineers who majored in "structural" could design and construct the facilities but that operation required so many other sciences that the sanitary engineer had to be a specialist. After the talk, Prof. Gates of the Sanitary Engineering Dept. at Cornell called my attention to a grave misrepresentation. As Prof. Gates points out, when it comes to the overall design of operating facilities one should be a sanitary engineer, whereas a structural engineer can design the structural features of the facilities and supervise construction. I think the distinction is well put and hope this makes amends for a rather incomplete statement on my part.

★ ★ ★

In April, at Manhattan College's Conference on Instrumentation, I saw Joe Doman. Hadn't seen him for some time. He used to be Supt. of Sewage Treatment at Greenwich, Conn. and then went into a consulting office. For the past couple of years, he's been with the Dorr Co. in their industrial division.

Joe asked me to answer this question: "If you were called on to make a sanitary engineering survey for a city discharging sanitary sewage into a stream, what *three* tests would you use?"

Joe said this was one of the questions on a Professional Engineer's examination. We didn't agree on the three tests .What tests would *you* use?

★ ★ ★

Something New — Well not exactly new, but The New York Section AWWA meeting in Watertown, N. Y. in April inaugurated a new feature, a Water Works School.

Beginning at the Sept. meeting, the first session of each convention on the morning of the first day will be devoted to a Water Works Practice School, with lectures on funda-

(*Please turn to page* 18)

at Arlington Heights, Illinois . . .

the plant *—a system built in 1931 consisting of Imhoff Tank and P.F.T. fixed nozzle filter bed.*

the problem *—population nearly doubled since 1946 . . . how to expand economically to handle heavier loads.*

the solution *—addition of P.F.T. equipment to make better use of existing structures!*

Plant expanded—older structures utilized

WITH MODERN P.F.T. EQUIPMENT

To increase capacity in the original filter bed, the P.F.T. 16″ trapless siphon was supplemented with a *P.F.T. 20″ trapless siphon*, providing a total of 383 nozzles located on stub laterals of the original distribution system. Results: capacity increased to over 300% applied to the *same filter bed;* greater flow and more uniform distribution without additional use of head!

For additional capacity and more complete treatment, a 120 ft. diameter filter bed was installed and equipped with a *P.F.T. Rotary Distributor*. Handling 3,000 g.p.m., it serves as a *primary* filter ahead of the fixed nozzle filter and may also be used *parallel* with the fixed nozzle filter during storm flows! Five *P.F.T. 8″ Rotary Sludge Withdrawal Valves* control sludge removal from the primary and secondary clarifiers.

The Imhoff Tank was converted to modern sludge digestors, each equipped with *P.F.T. 35′ Floating Covers* for safe gas collection, simplicity of operation and *more complete treatment*. In converting the Imhoff, baffles forming the sedimentation compartment were removed and the outside walls extended 8 feet. Results: "controlled" digestion and greater capacity!

Heat for the new digestors is provided by a *P.F.T. Heater and Heat Exchanger Unit* which is fired by sludge gas. The unit cuts fuel costs by utilizing all sludge gas available, automatically changing to oil only as necessary. Other P.F.T. digestion control equipment includes: *2 Supernatant Selectors with Gauge, Sight Glass and Sampler Units;* various items of *Gas Safety Equipment*.

Pictured in the photograph above are: (left) the primary filter bed with Rotary Distributor, (right center) the converted Imhoff Tank fitted with Floating Covers, (right) the revised fixed nozzle filter.

Further information on Arlington Heights equipment is yours upon request.

Design of plant by / *Consoer, Townsend & Associates, Chicago, Illinois*

P.F.T. first supplied equipment to Arlington Heights in 1911. This early equipment consisted of six 10″ plural alternating siphons to automatically dose sand filter beds. The 1911 plant was designed by W. S. Shields, Chicago, Ill.

P.F.T.

waste treatment equipment exclusively since 1893

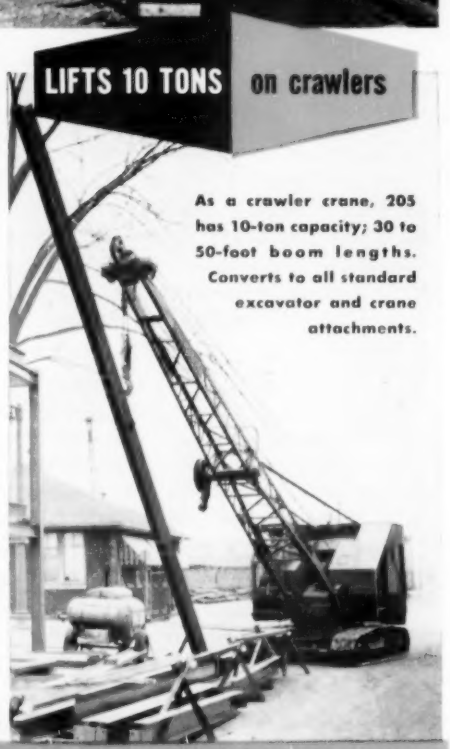
PACIFIC FLUSH TANK CO.

4241 Ravenswood Avenue
Chicago 13, Illinois

NEW YORK • LOS ANGELES • SAN FRANCISCO • CHARLOTTE, N. C. • JACKSONVILLE • DENVER

Need more facts about advertised products? Mail your Readers' Service card now.

NEW Koehring 205 Truck Crane gives you lowest price per pound of lifting capacity. Its maximum 15-ton lift (on 25-ft. boom) offers a big *plus* in work capacity over other machines in the "½-yard" class. Remember, lift capacity is WORK CAPACITY. The 205's extra lift capacity increases its work capacity with all attachments. As a clamshell or dragline, it handles ½ to ¾-yard buckets on a wide work range. As a heavy-duty ½-yard shovel or hoe, its extra strength and powerful cable crowd increase production and speed of operation.



As a crawler crane, 205 has 10-ton capacity; 30 to 50-foot boom lengths. Converts to all standard excavator and crane attachments.

CHECK THESE OTHER 205 ADVANTAGES:

- 32½ m.p.h. travel speeds on rubber-tired truck mounting.
- Only 2 major shafts in upper machinery — simple, accessible.
- Big 20-inch clutches, self-adjusting.
- 4 hook-rollers, eccentric adjustment.
- Antifriction power flow for dig, lift, swing, and travel.
- On standard or extra-long crawlers, 16, 20, or 24-inch shoes.
- Automatic crawler traction-brakes.
- Independent traction optional.

K484 PW

Get the complete story in new 205 bulletin. Ask your Koehring distributor for your copy . . . or write us:

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Now's the time to mail this month's Readers' Service card.

how much does it cost to run the old model?

Even if you bought new today one of the old model chlorinators, you can actually scrap it right now and save money!

How can such a thing be?

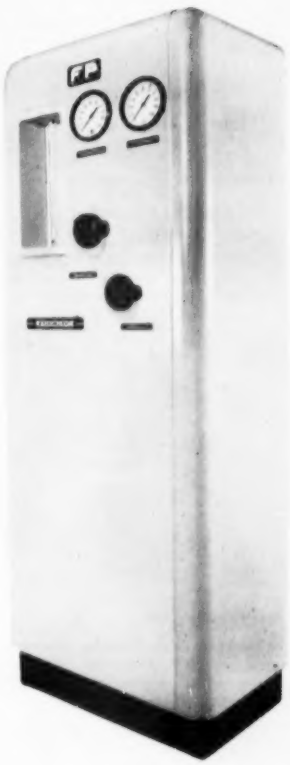
In hundreds of installations using F & P Chlorinators it has been proven conclusively that costs of operation and servicing are so much lower than old style chlorinators that it actually *costs money* right from the first day of operation to have an old style chlorinator.

Fischer & Porter designed this new chlorinator right from the floor up. New materials are used throughout to make it impervious to corrosion. Encased in a fibre-glass cabinet, the new F & P Chlorinator handles chlorine—in fully enclosed, tightly sealed, corrosion resistant pipes and components. It is the best, safest, most efficient, easiest operating chlorinator ever devised.

Right from the purchase price you save money on an F & P Chlorinator. And you save money every day thereafter, because you have less maintenance cost, less chance of breakdown with sky-high service charges, no need for multiple reserve units or scores of spare parts, no wasted chlorine gas lost through water seals.

As a top municipal official, as an ethical consultant, as a practical operating man—you must admit if all these things we say are true, you can't afford to ignore this new chlorinator.

It won't cost you a single penny to *get the facts* about the F & P Chlorinator. It will obligate you in no way. Why not write today?



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RIGHT NOW YOU MAY BE STEAMING HOT! IS ALSO THE TIME TO PLAN FOR NEXT WINTER'S SNOW REMOVAL AND ICE CONTROL. BE PREPARED! SEND FOR OUR SNOW PLOW CATALOG.

ONE-WAY PLOWS

Gledhill has a complete line of one-way and reversible snow plows. Crimped blade means better aeration—more snow-throw. Interchangeable, direct lift.

ICE CONTROL

Here is an unbeatable ice control unit for its size and price. Ladder-platform goes with it—adds greatly to safety and efficiency.

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO

Doc Symons

(*Continued from page* 14)

mentals that cannot be covered in the usual operators' short schools held by the State Health Dept.

Each session will have two lectures plus a question and answer period. High interest was evidenced at Watertown where 70 plus persons attended the introductory session.—In case you care, the Trustees of the Section asked me to take charge of the feature. Any suggestions? ? ?—The September meeting will be held at Montauk Point, Long Island.

★ ★ ★

Purely Personal — From one local newspaper "James M. Symons, son of Dr. and Mrs. George E. Symons of Larchmont was graduated from Cornell University with a degree in Civ. Eng., and "with distinction." While at Cornell, he was elected to Tau Beta Pi, national honorary engineering fraternity and Chi Epsilon, national honorary civil engineering fraternity and was on the Dean's honor list. He is a member of Acacia Fraternity, and was Vice Pres. of the Student Chapter of A.S.C.E. at Cornell and was Chairman of Engineers Day of the Sanitary Engineering Dept. for two years. Mr. Symons will enter Mass. Inst. Tech. for graduate work in Sanitary Engineering in September"—Move over Doc!!!

★ ★ ★

News Notes from Brushy Bend — The Eastern Sectional meeting of the Penna. Wat. Wks. Oper. Assn. was held on Friday May 21, at the water filtration plant in Easton, Pa. John Fulmer, Chemist, and W. B. Johnson, Supt. gave a conducted tour of the plant and showed off the fluoridation equipment and the reconditioning of a 1.0 mgd filter—Before dinner there were "grab samples" for tastes and odor tests. —On Tues. May 25, The Metropolitan Section of NYSIWA held its last meeting of the season. The topic was "Main Sewage Pumping", with papers by Charles H. Stralton, Supt. of Rockaway Plant and Alan L. Fay, Bureau of Sew. Disp. Design.

★ ★ ★

Late News Flashes! — I hear that "Duke" Donaldson of the New York City Bureau of Sewage Disposal will retire come Aug. 1.

From Chicago to Seattle, the direct AWWA tour was under the able direction of Cy Bird of the Pitometer Co. It wasn't Cy's fault that the train had to detour around the floods of Bonner's Ferry, Idaho. . . . Being 5 hours late had its recompense. We were able to see the beautiful Cascade Mountains, which we would have slept through, if on time. . . A few hardy folk were up at 4 a.m. to see the falls at Spokane. . . . Everyone was up in time to detrain at Wenatchee, where the lunch room did a brisk business in apples and post cards.

Best story on the trip was by Johnny Hawkins of Greenville, S. C., who said, "The trouble with the world today is that the dollar is only 5 inches long and they're trying to use it as a yardstick."

We arrived in Seattle at 1 p.m. in plenty of time on Sunday to register, see exhibits, partake of potlatch and powwow mightily.

More next month. . .

V.T.Y.—Doc Symons

★ ★ ★

Highway Accidents Cost More Than Road Building

Highway accidents cost West Virginia more a year than the state spends on its highway program. L. Walter Lundell, vice president of the C. I. T. Financial Corp., stated recently that an economic loss of $38,475,000 resulted from traffic mishaps in West Virginia in 1952. State and Federal expenditures on West Virginia roads during the same year totaled $23,311,000.

The cost of traffic accidents, Lundell said includes property damage, wage losses, medical expenses and the overhead cost of insurance.

• • •

Getting Ready for Winter

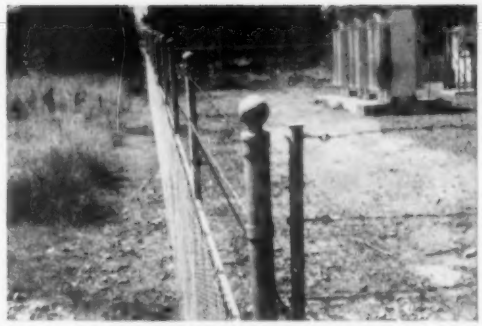
Up in Ashland, Wisc., where snow is snow, and someone has to plow it, an unusual parking regulation is in effect. In the first three months of the year, cars may be parked only on the even-numbered side of the street on even-numbered days, and on odd-numbered days on the odd-numbered side; but in some of the downtown sections, street parking is prohibited.

• • •

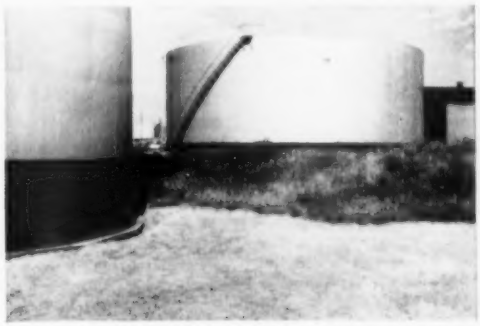
Radio Telephone for Water and Snow Work

For closer control and better utilization of equipment, one snow plow belonging to Hopkins, Minn., has been equipped with radio telephone. Similar equipment has also been installed on two of the emergency sewer and water trucks.

1. "Telvar" W has extra-long residual action. Track on right was treated in April; photograph was taken in August. Ideal for sidings, around loading docks, etc.



2. Note the thorough weed control under and around this security fence and power substation.



3. Fire hazards are reduced around oil storages and pipelines from thorough, long-term weed control with "Telvar" W.

Kill weeds with Du Pont "Telvar" W *Weed Killer* —long residual action lasts all season

HERE'S a new, low-cost way to solve your weed control problems. Just one application of "Telvar" W can get rid of unwanted vegetation for a full growing season or longer. This powerful weed killer works through the roots . . . and remains in the ground to prevent regrowth. "Telvar" W keeps storage and working areas clear, neat and accessible . . . kills vegetation that may cause a fire hazard or a cover for vermin.

SAVES MONEY, TIME AND WORK . . . One spray usually does the job . . . repeat applications are seldom necessary. No bulky chemicals to handle or store. Just 1 to 1½ pounds per 1000 square feet (40 to 60 pounds per acre) will do the job.

EASY TO USE . . ."Telvar" W is a wettable powder, ready to mix with water; can be applied by machine equipment or ordinary knapsack sprayer. It doesn't corrode metals, is non-flammable, has unusually low toxicity and it is non-volatile.

IF YOU DON'T HAVE EQUIPMENT to apply "Telvar" W, a custom sprayer will do the job for you. In fact, you may want to take advantage of his year-round service.

DU PONT **TELVAR W**
TRADE MARK
REG. U.S. PAT. OFF.

weed killer for low-cost weed control

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

On all chemicals always follow directions for application. Where warning or caution statements on the use of the product are given, read them carefully.

MAIL THIS COUPON FOR FREE BOOKLET

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Department, Rm. 4026
Wilmington, Delaware

☐ Please send me your booklet describing low-cost weed control with "Telvar" W. ☐ Send me the name of my nearest supplier. ☐ Give me the name of a near-by custom sprayer.

Name_____
Firm_____
Position_____
Address_____
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Thousands use our Readers' Service card to keep up to date . . . do you?

"Pipe installation time and labor costs cut about 50% with Greenlee Pipe Pusher"

That's what a leading eastern utility reports as its experience with a GREENLEE Pipe Pusher on jobs as shown above. Let this remarkable tool make big timesavings and reduce job costs for you, too. With the GREENLEE Pusher, *one* man pushes pipe *under* streets, walks, floors, railways, lawns, etc. Eliminates extensive trenching and time-consuming tearing up, tunneling, backfilling, repaving. Often pays for itself on the first few jobs. Two models: No. 790 for pushing ¾" to 4" pipe; No. 795 for larger pipe and concrete ducts.

POWER PUMP for all models of GREENLEE Pipe Pushers. Makes the toughest pushing jobs simple, fast for *one man*. Average pushing performance: two feet per minute. Write today for complete details on timesaving GREENLEE Hydraulic Pipe Pushers.

GREENLEE

GREENLEE TOOL CO., Division of GREENLEE BROS. & CO.
2047 Columbia Ave., Rockford, Illinois

UP FRONT FOR ADEQUATE ROADS

BY
LEO J. RITTER, JR.
New York University

Awakening the Public — The National Highway Users Conference has recently made "Golden Milestone Awards" to five state highway departments. The awards went to Colorado, Maryland, Massachusetts, Oklahoma, and Washington. These organizations were honored because of their success in translating their highway programs into understandable facts and figures, and in distributing this information to the public. The awards are designed to focus attention upon the importance of awakening the public to the needs of the highway program and enlisting the support of the voters in providing the money necessary for a solution of highway problems. Essentially, the awards were based upon the excellence of annual (and other) reports prepared by the highway department in each state. The designation "Golden Milestone" refers to the marker which was erected at zero mile in the heart of Rome, the beginning point of the far-flung road system of the ancient Roman Empire.

Control of Asphalt Mixes — The California Department of Highways, after many years of investigation, has come up with an improved field extraction device for use in the control of asphaltic paving mixtures. The equipment and test procedure are described in detail by Ernest Zube in a recent issue of *California Highways and Public Works*. The device is intended to provide a better method for the control of asphalt content, moisture content, and aggregate gradation of paving mixtures. The apparatus is portable, easy to assemble, and simple to operate, and gives dependable test results in less than four hours. The extraction is carried out in two stages. In the first step, any free moisture in the mix is removed by distillation and condensed in a moisture trap. After this, the asphalt-laden solvent is removed by passing it through filter paper by the use of compressed air. Clean solvent is then used to flush the sample, after which the aggregate is ready for drying. The asphalt content may then be calculated and the grading of the aggregate determined.

A Personal Note — Some of you may be interested in knowing that your author has decided to forsake the "ivory towers" of academic life for a while, at least. Beginning very shortly, we will be in association with Howard Hansen, Inc. in Naperville, Illinois (a suburb of Chicago). Among other things, we will offer a technical writing service to industrial organizations, and will be glad to help any group prepare sales literature, training manuals for use both inside and outside the organization, and training programs. Our very pleasant association with *Public Works* will continue.

Movie — One of the nicest industrial-type movies we've seen in a long time is "The Builders", sponsored by the Wire Reinforcement Institute. This 30-minute color, sound film has a professional cast and tells a story of modern construction, with emphasis on the use of welded wire fabric. The film is of interest to both general and technical groups. It is being distributed by Modern Talking Picture Service, Inc., 45 Rockefeller Plaza, New York 20, N. Y., and is available free of charge, except for transportation charges. We saw it late in May in the plush Johnny Victor Theatre at the RCA Exhibition Hall in midtown Manhattan. Makes a nice showing for school, civic, and professional groups.

Contract Maintenance — A recent report by the AASHO indicates that maintenance by contract is a growing business, and is becoming a significant factor in helping many

Two SURE FIRE Ways to Please Taxpayers

GoodRoads LEAF COLLECTOR GoodRoads SCAVENGER

For *Most Efficient* Leaf Collection and Rubbish Clean-Up

No need for your constituents to complain about dirty streets or messy accumulations of leaves or other debris on roadways, sidewalks, parks or other public grounds. The two units illustrated are designed specifically to keep these areas clean—and to do it quickly, economically, efficiently.

LEAF AND LITTER COLLECTOR

The Good Roads Leaf Collector with "Tornado power" cleans up leaves, litter and debris like magic. Wet or dry, loose or compact, makes no difference. It reaches around and under parked cars and any other hard-to-get-at places—no sweeping, no dirt, no mess. Only two men—one driving the truck or tractor and one handling the suction tube—can do as much work in a day as ten or more with other equipment. Leaves are pulverized and deposited in the 14 cu. yd. hopper. The compacted "packaged compost" is readily dumped by hydraulic action wherever fertilization is desired.

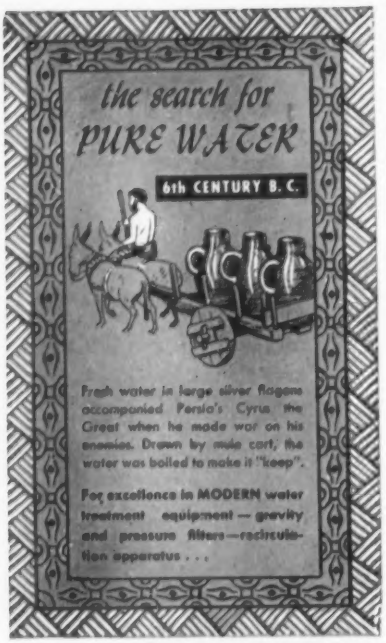
MOTORIZED SCAVENGER

The Goods Roads Scavenger works like a giant heavy-duty vacuum cleaner—picking up all kinds of debris and rubbish on roadways, parks, picnic and recreation gounds, golf courses, cemeteries, etc. Bottles, cans, papers, rags, cartons, leaves, twigs—wet or dry and almost regardless of size and weight—are whisked into the 12 cu. yd. hopper with ease. When filled, the hopper can be quickly emptied by its own hydraulic self-dumping mechanism. The operator rides in a comfortable seat to direct the suction tube. Convenient push-button buzzer signals the tractor or truck driver.

Don't wait for "Clean-up Week." Keep your public areas clean and your taxpayers happy at all times with Good Roads Leaf Collector and Scavenger. Write for complete information to GOOD ROADS MACHINERY CORP., MINERVA, OHIO.

SNOW PLOWS ICE CONTROL SPREADERS AGGREGATE SPREADER LEAF COLLECTOR SCAVENGER

Now's the time to mail this month's Readers' Service card.


the search for
PURE WATER
6th CENTURY B. C.
Fresh water in large silver flagons accompanied Persia's Cyrus the Great when he made war on his enemies. Drawn by mule cart, the water was boiled to make it "keep".
For excellence in MODERN water treatment equipment — gravity and pressure filters — recirculation apparatus . . .

MECHANICAL EQUIPMENT BY ROBERTS FILTER MFG. CO. DARBY, PENNA.

ROBERTS FILTER MFG. CO.

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Darby, Pa.

TAYLOR COMPARATORS

EASIEST . . . three simple steps give you the answer. Every set contains all reagents and accessories needed.

FAST . . . most tests take only a few seconds, others only a few minutes. All sets are lightweight, portable so you can make on-the-spot tests anywhere in the plant. No time wasted carrying samples back to the lab.

ACCURATE . . . *all liquid color standards carry an unlimited guarantee against fading.*

All standards for any one determination are housed in sturdy plastic slide. No single standards to handle.

See Your Dealer Soon!

FREE MANUAL

"Modern pH and Chlorine Control" gives theory and application, illustrates and describes full Taylor line. Write today.

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states solve their maintenance problems. The report, based on 1952 figures, shows that $100 million, or about one-sixth of total state highway department maintenance expenditures, was spent on contract work. Maintenance by contract was being carried on in 38 states, with 65% of the dollar volume of this type of work being carried on in 12 states. Biggest volume was in Ohio, over 9 million dollars. The states which answered the questionnaire upon which the report was based indicated some 38 items of maintenance which lend themselves to contract operations. Included in the list are many of the basic maintenance procedures, ranging from surface repairs and replacement to roadside mowing, snow removal and ice control.

Pennsylvania Program — The educational program of the Associated Pennsylvania Contractors is now in its second year, and is proving to be highly successful. As we went to press, indications were that about 75 students will participate in the program this summer by working with contractors, engineering firms, the Pennsylvania Department of Highways, and other groups in the highway field. Interest has become so great that a screening process is now being used to select students for the program. This is a real deal, since it is bound to interest many young civil engineers in making careers in highway engineering. It thus helps to alleviate the critical shortage of engineering manpower in this field.

State-Local Cooperation — We've been looking over the report on "Recommended Principles for a State-Local Partnership in the Use of State and Federal-Aid Funds on Jointly Financed Road Systems", which appears in the April issue of *American Highways*, the organ of the American Association of State Highway Officials. The report, which is much too long to be adequately condensed here, provides food for thought for all those concerned with state-local cooperation in highway administration. As a sort of summary of the report, the committee responsible stated its belief that a state-local partnership can work only if the following principles are adhered to:

"(1) Technical county management;

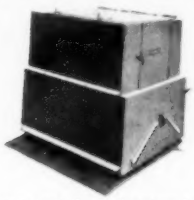
(2) A designated system of roads initiated by the county and agreed upon by state and county officials on which there is a joint financial responsibility and on which a partnership program can take place;

(3) State counsel and assistance on technical and administrative questions; and

(4) Delegation of authority to those charged with responsibility for handling partnership questions."

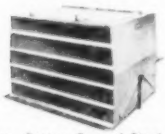
About People — K. B. Woods, an outstanding leader in highway research, will become head of Civil Engineering and Engineering Mechanics at Purdue upon the retirement of R. B. Wiley this month. Speaking of Purdue, we hear that Ralph Morgen will become Director of the Purdue Research Foundation; Ralph has been at the National Science Foundation. Ham Dowling has replaced Sam Turnbull as Chief Engineer of the Florida Road Department. Visited with Walt Johnson, Earl Campbell, Frank Wray, and Elmer Ward of the Highway Research Board staff in May; as usual, they were hard at work. They told us of the untimely death of W. H. Root, Chairman of the Board. R. A. Harris has resigned his post as Chief Engineer of the Mississippi State Highway Department to accept an interesting assignment with the government of Colombia. Dame Rumor has it that H. A. Radzikowski is slated to become an Assistant Deputy in the Bureau of Public Roads.

Just Wandering — 1960 is the target date for completion of the 5000-mile Trans-Canada Highway, construction of which is being undertaken jointly by the federal and provincial governments. The New Haven (Conn.) Trap Company recently put into service the largest "asphalt plant" in the East; capacity is 3½ tons per minute. George Gallup of the Institute of Public Opinion at Princeton has announced that the American people "overwhelmingly" support the construction of four national superhighways (toll roads) spanning the country from east to west and north to south. Don't hold your breath until they're finished, though. The Massachusetts legislature, early in May, approved a $150 million bond issue to continue that state's accelerated highway program. Last summer saw the completion of 28 miles of soil-cement base construction in northeastern Colorado by the State Highway Department. Use of this material may be a solution to the old problem of lack of suitable aggregates in that section of the state.



Universal Type Container is available in 4 to 12 cu. yd. capacities with or without top lids.

Apartment Type is available in 4 to 10 cu. yd. capacities. Note Sump Bottom, also available in Universal, Standard Drop Bottom and Drop Bottom Pressed Steel Type containers, for handling moist rubbish.



Drop Bottom Pressed Steel is available in 5 to 10 cu. yd. capacities without or with top lids.

Standard Drop Bottom, available in 2 to 10 cu. yd. capacities, is ideal for many materials handling uses.

Tilt Type, with two top lids, is available in 2 to 7½ cu. yd. capacities.

Multi-Karry Container comprises a master 6 cu. yd. container with three 2 cu. yd. box-like containers on casters. Each of the 2 cu. yd. containers may be rolled to a trash accumulation point. When loaded they are returned to master container and all three taken to dump and emptied by truck-mounted Dempster-Dumpster.

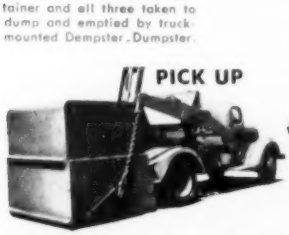
You will Dump High Costs, too

. . . when you install the Dempster-Dumpster System of Trash and Rubbish Collection

Cities over the nation have learned to eliminate the costly and inefficient method of handling trash and rubbish with conventional trucks, drivers and loading crews. You can equip one truck with a hydraulically operated Dempster-Dumpster. This truck-mounted Dempster-Dumpster, with only one man, the driver, serves scores of detachable Dempster-Dumpster Containers, as shown below. These containers replace unsanitary and unsightly trash cans, barrels, crates, etc. at such places as hotels, schools, hospitals, restaurants, department and grocery stores, market and housing areas, etc. Each is loaded by the user. By pre-arranged schedule your truck-mounted Dempster-Dumpster picks up, hauls and dumps each container—one after another.

We show at left a few of the popular designs being used. One Dempster-Dumpster handles them all, regardless of design or size. Containers built for handling trash and rubbish have doors or lids, permitting contents to be sealed up and eliminating rats, flies and the scattering of refuse by winds and scavengers.

You eliminate trucks standing idle. You eliminate re-handling of trash and rubbish. You eliminate loading crews. You increase efficiency, sanitation and city-wide cleanliness with this Dempster-Dumpster System —the lowest cost method of trash and rubbish collection ever devised. Write to us for complete information. Manufactured exclusively by Dempster Brothers, Inc.



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DEMPSTER BROTHERS, 974 Dempster Bldg., Knoxville 17, Tennessee

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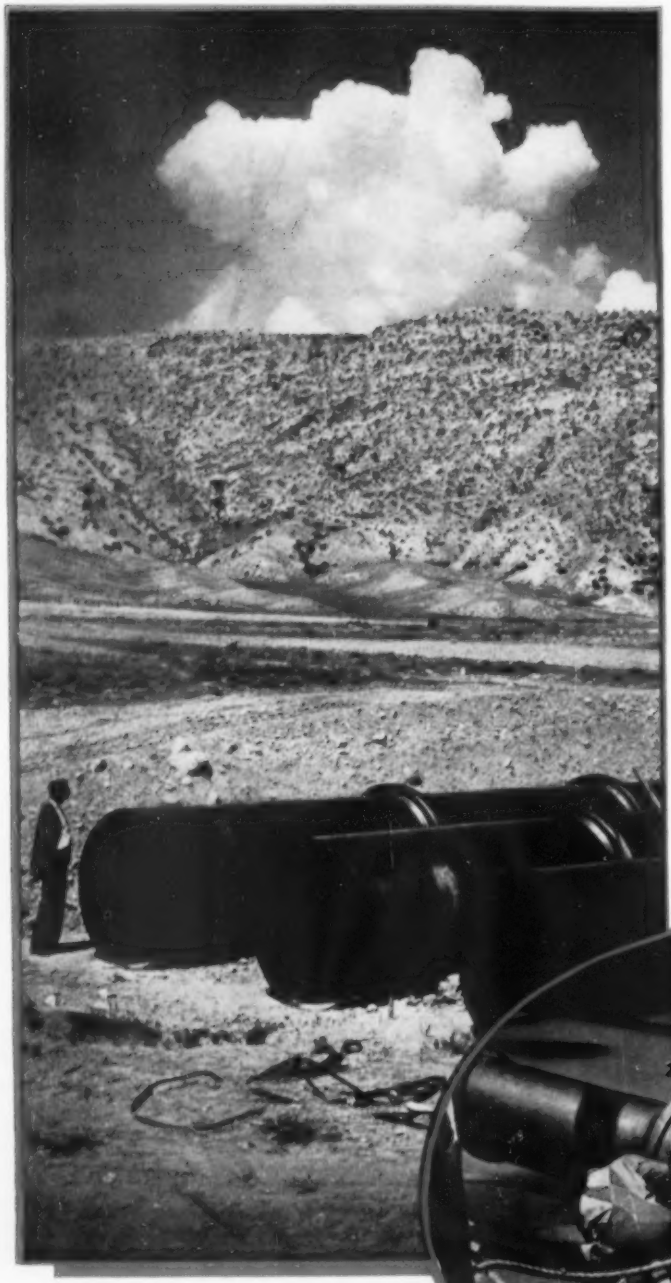
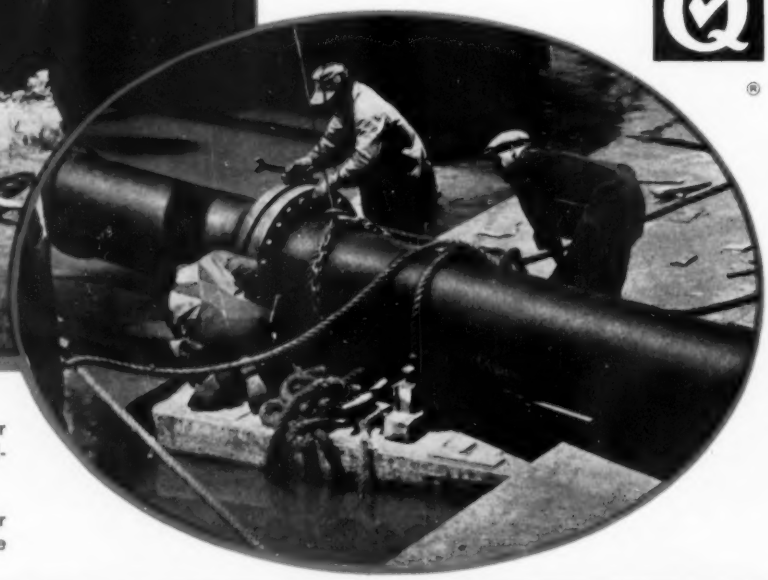


Versatile-

You know, of course, that cast iron pipe is widely used for water and gas mains, pressure sewers and outfalls, and almost exclusively in water filtration and sewage treatment plants. It is not so well known that this versatile pipe is also rendering yeoman service to Industry in keeping down maintenance cost in many applications. Such industries, for example, as chemical, paper, rayon and other process industries; coal mines and oil refineries; railroads and steel plants. Where effective resistance to corrosion is mandatory for long life and economy, specify cast iron pipe. For information write: Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago 3, Ill.



1800 feet of 36" to 60" cast iron pipe for culvert in connection with relocation of railroad tracks in Wyoming

(At right) A river-crossing cast iron water line near Chester, Pa., showing flexible joint assembly.

CAST IRON PIPE

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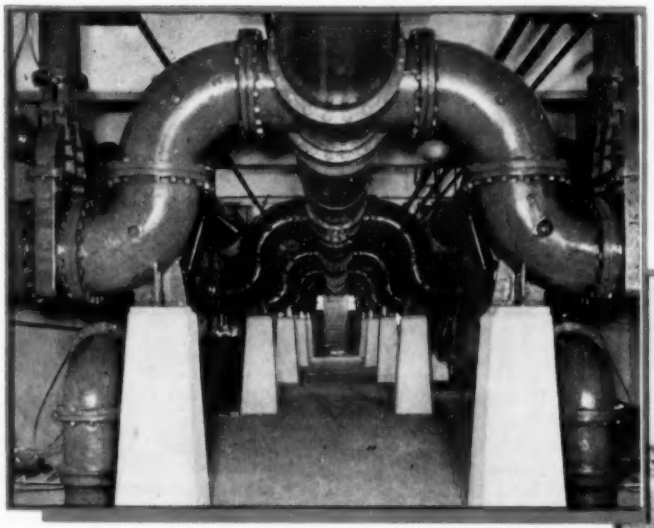
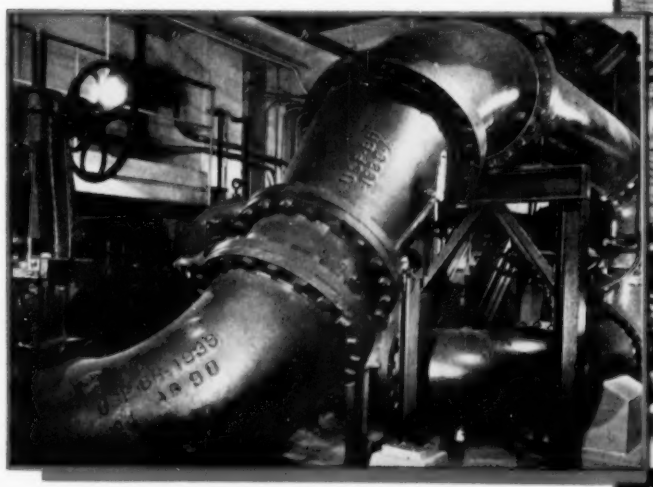
is the word for CAST IRON PIPE



Cast iron pipe and fittings installed in gallery of water filtration plant in Muskegon, Michigan.

Submarine installation of cast iron flexible joint pipe for outfall sewer into Long Island Sound at Fairfield, Conn.



Installation of cast iron pipe and fittings in steam plant of a gas and electric utility in California.

SERVES FOR CENTURIES...

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Here's Proof—

You can do it yourself with the BONDACTOR and stretch your budget!

BEFORE restoration of concrete bridge by Kentucky State Highway Department. Note severe deterioration of concrete by spalling. First step, chipping; then sandblasting with Bondactor.

DURING OPERATION. Bondactor nozzleman applies shot concrete 1" to 5" thick, completing restoration of bridge abutment in one application.

AFTER restoration with a Bondactor, the bridge is up to rated load limits. Cost of new bridge was estimated at $25,000. Total cost of Bondactor operation—$3,500!

Kentucky State Highway Concrete Restoration Rig PAID FOR ITSELF IN NINETY DAYS!

That's right! The Kentucky State Highway Maintenance Department has a portable rig for repairing and maintaining concrete bridges which paid for itself in 90 days! The rig features the Model 1250-S Bondactor, used for concrete gunning, the Mix-Elvator — a dry mixer and elevator — and a 105 CFM air compressor mounted on a straight truck. Mr. T. J. Hopgood, Assistant Director of Maintenance says, "Our unit makes it possible to accomplish far more concrete bridge repairing than ever before on our annual maintenance budget."

The best part of this story is that *you* can do the same thing yourself! The Bondactor is proved in use for many public works applications: curb repairs, construction and repair of swimming pools, settling basins; bridge viaduct and overpass restoration; dam repairs; installation and repair of sewers; gun-grouting of sewer pipe joints; sandblasting.

Accept This Invitation!

Investigate this budget-stretching plan today. Full details on the Kentucky rig, the three models of Bondactors and the Mix-Elvator will be rushed to you upon request. Write, wire or phone today! State intended use and materials to be gunned.

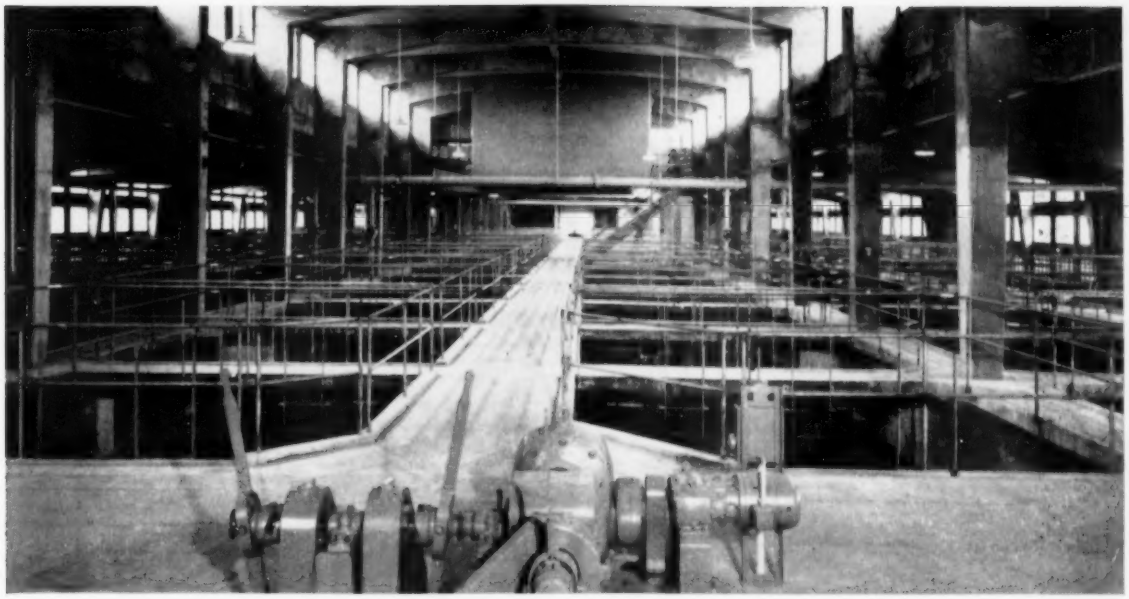
Air Placement
EQUIPMENT COMPANY
1013 West 24th Street
Kansas City 8, Missouri

Now's the time to mail this month's Readers' Service card.

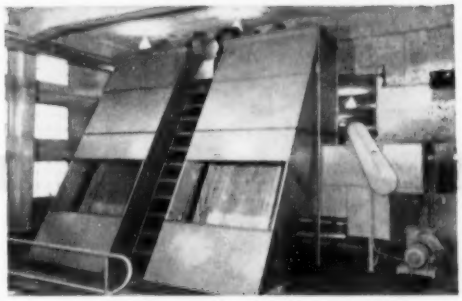
LEADERS IN PUBLIC WORKS

T. H. Sauter went to work for the City of Cuyahoga Falls for a 6-month period back in 1935, and that temporary job has stretched into nineteen years now. He was then field engineer and equipment layout man for the new water plant then under construction. In 1938, he became assistant to the city engineer, and in 1941 he was made City Engineer. Since he took that office, Cuyahoga Falls has grown from about 20,000 population to more than 36,000; the City Engineer's office from a scant handful to 28; the paved streets from 29 miles to 108. There have been built an 80-ton incinerator, a new fire station and a $750,000 City Hall; and a water works expansion program involving $370,000 has just been completed. These accomplishments are cited merely to show how this quaint "Western Reserve" town did grow and how the responsible officials met the needs that arose with that growth.

As for Mr. Sauter, he confesses to a sincere liking for golf, dating back to his caddying days in Williamsport, Pa. He went to the University of Pennsylvania for a year and the University of Akron for five years, receiving a Masters Degree in Civil Engineering, graduating in 1927. Shortly thereafter he married Miss Helen Phillips, a descendant of early Ohio colonists. They have one son, who is now at the University of Akron. Mr. Sauter was the tenth of thirteen children, growing up under the "Pennsylvania Dutch" influence of his mother. He is a past president of the Lions Club, of the local Art Center and of the Local Professional Engineers and a member of Sigma Tau.



At North Point plant, opened in 1951, three of the six pre-aeration settling tanks—each equipped with two Link-Belt Straightline longitudinal sludge collectors and one cross collector—are shown above. By combining pre-aeration and settling in the same tank, system cuts construction costs, improves efficiency. Two Link-Belt mechanically cleaned bar screens (right) remove large solids at Southeast treatment plant. Sludge from here and that pumped six miles from North Point are both treated at the new Southeast sludge plant.



San Francisco gets a clean water front

Pre-aeration and LINK-BELT equipment provide top efficiency, low cost at two new sewage plants

After 100 years of discharging raw sewage into the Bay and the Pacific, San Francisco built its first treatment plant in 1939. This Richmond-Sunset Works was equipped with Link-Belt grit and sludge collectors, bar screens, mixers, gates and conveyors.

So satisfactory was the Link-Belt equipment's performance that, when two new sewage treatment plants were planned, San Francisco again relied on Link-Belt. In the three plants, Link-Belt equipment helps treat an average design flow of 110 mgd, with a peak capacity of 260 mgd.

If you're planning new sewage, water or industrial waste treatment facilities—or the enlarging of existing capacity—find out how Link-Belt's broad line of quality equipment can serve you. Our engineers will work with you, your chemists and consultants—help you get top efficiency at lowest overall cost.

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,427

LINK-BELT

SANITARY ENGINEERING EQUIPMENT

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6 reasons why TRICKLING FILTERS are best for sewage and industrial waste treatment

(1) *LOW COST.* First costs are reasonable, and the operating ones will really save your community money. (2) *EASY AND SIMPLE OPERATION.* In most plants one man in a 40 or 44 hour week can do the work. (3) *LONG LIFE*—longer than the life of the bonds you issue to pay for them. (4) *GOOD RESULTS*—Top notch effluent—say 20 ppm BOD—day after day, year after year. (5) *RELIABILITY* distinguishes them. (6) *OVERLOAD IS NO PROBLEM.* Take temporary shock loads—or those of a new industry right in their stride.

WYMORE, NEBRASKA, SEWERAGE TREATMENT PLANT

Accelo Filter by Infilco, Inc., High Rate. Filter diameter 32 feet. Design loading: Organic 268 pounds 5-day BOD sett'ed sewage Hydraulic 200 GPM including recirculation.

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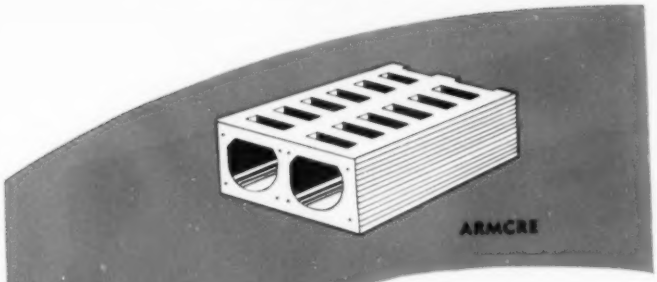

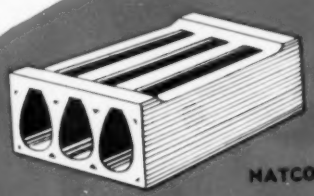

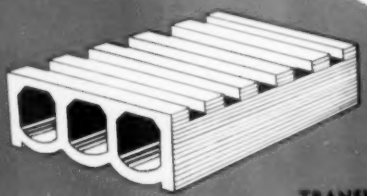

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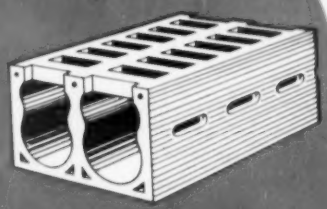
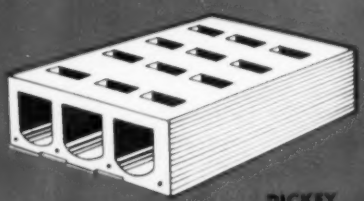
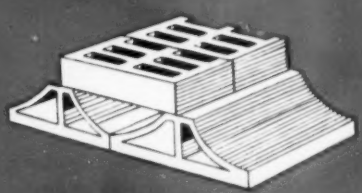
use TFFI specification *vitrified clay filter blocks in your* trickling filters.







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The best trickling filters use *vitrified clay filter bottom blocks*. We have just issued an enlarged and revised edition of this popular handbook. If you don't have one write for your copy today without obligation. Just address any member of the institute and it will be sent free of charge.

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WITH NEW RING-TITE COUPLING

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? Did you participate in the June 14 CD activities?

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If you can honestly say "yes" to these questions you are among the few to earn congratulations!

EVALUATION is in order!

There is still time for an honest appraisal of your needs. CD preparations daily grow more vital. ACT while FEDERAL assistance is still available.

FEDERAL Thunderbolt and STL-10 air-raid sirens proved their superior worth in these recent tests. If you are not familiar with these outstanding air-raid warning signals, don't fail to obtain full information before you complete your CD systems. ACT NOW—DO IT TODAY!

ACT *NOW!*

DO IT *TODAY!*

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68. Descriptive literature on the Reed 4-wheel hinged pipe cutter which operates in close quarters, gives quick, easy right-angle cuts, is available from Reed Mfg. Co., Erie, Pa. Check the coupon.

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355. Full information on Homestead lubricated plug valves in full-port and venturi types, sizes up to 14", and with a choice of self-sealed two-piece plug or one-piece plug designs. Engineering information includes principal dimensions, types of control, metals, lubricants, etc. For your copy write Homestead Valve Mfg. Co., Coraopolis, Pa., or check the coupon.

Information Offered on Industrial Waste Treatment

356. Applications of Graver equipment in the treatment of industrial wastes are demonstrated with the problem-solution-result type of explanation in a bulletin published by Graver Water Conditioning Co., 216 West 14th St., New York 11, N. Y. Get Bulletin WC-116 by checking the coupon.

A Guide to Effective Traffic Safety

360. A 20-page catalog, with hundreds of color illustrations of all types of signs used on highways and in motor and pedestrian traffic areas is offered to public works officials by Traffic and Street Sign Co., 84 Foundry St., Newark 5, N. J. Get this convenient reference that covers all your sign needs by checking the coupon.

Road Maintenance Equipment Covered in General Bulletin

306. Full specifications on the Gledhill line of road maintenance equipment, including graders of economical design, earth movers, roadside sprayers, snow plows and replacement blades, is covered in an illustrated bulletin available from the Gledhill Road Machinery Co., Galion, Ohio. Check the coupon for this convenient data.

Reduced Sludge Volume Cuts Sewage Treatment Costs

346. The applications, operation and advantages of the Dorrco "Densludge" process for the production of thicker sewage sludge are covered in Bulletin 6260, available from the Dorr Co., Barry Pl., Stamford, Conn. Operating results, flow-sheets and full engineering data are included. Get your copy promptly by checking the coupon.

Have You Investigated Smith Ball Valves?

375. Smith Ball Valves, offered in sizes from 12" to 48" for shut-off service at pressures up to 150 psi, manually operated, are described in an attractive 8-page brochure issued by S. Morgan Smith Co., York, Pa. Be sure to investigate the characteristics and applications of this type of valve. Check the coupon.

Helpful Bulletin Provides Valve Data

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Convenient Data on Steel Light Poles

34. Steel light poles, brackets, accessories and modifications are described and fully illustrated in a comprehensive 16-page bulletin issued by Pacific Car and Foundry Co., Renton, Wash. Besides complete product data, many installation details are shown in this useful brochure. Get your copy by checking the coupon.

How "Sanifil" Safeguards Sanitary Landfills

66. An outline of the sanitary landfill method of refuse disposal and a discussion of the extra safeguards provided by "Sanifil" spray for control of odors and prevention of insect and rodent infestation will be found in Bulletin No. 12 issued by Stewart-Hall Chemical Corp., 550 So. Fulton Ave., Mt. Vernon, N. Y. Check the coupon for this informative bulletin.

Comprehensive Bulletin On Traffic Signal Poles

277. Complete and detailed information on traffic signal poles, including design, dimension and construction data on mast arm, suspension and pedestal types will be at your fingertips when you get the fully illustrated 12-page Catalog No. 84 offered by Union Metal Mfg. Co., Canton 5, Ohio. It's easy to get—just check the coupon.

Semi-Automatic Control For Filter Backwashing

354. Developed to save cost and time, relieve plant personnel and insure accurate backwash rates for maximum filter efficiency, the Builders-Providence "Auto Central Filter Control" system carries out the backwash cycle and returns the filter to service automatically. Full information on this flexible system is clearly presented in Bulletin 480-LI. Write Builders-Providence, Inc., 345 Harris, Ave., Providence, R. I., or check the coupon.

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234. Insto-Gas torches and furnaces give trouble-free service for lead melting, soldering and all other jobs where a steady, clean, hot flame is needed. Convenient cylinders require no regulating gauges and attach directly to standard furnace assembly. Full details from Insto-Gas Corp., 1977 E. Woodbridge, St., Detroit 7, Mich. by checking the coupon.

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320. Be sure to investigate the Good Roads motorized "Scavanger" for the solution to your roadside cleaning problems. Powerful exhaust fan draws all types of debris into the air-tight body through a 12" dia. hose. Picks up bottles, cans, cartons, leaves, twigs, all kinds of debris—wet or dry. The 12 cu. ft. body is readily emptied with its own self dumping mechanism. Efficient, dependable filters hold back all solids to protect the blower rotor. Get full information by writing to Good Roads Machinery Corp., Minerva, Ohio, or check the coupon.

7-54

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This loader almost bites its tail

Turns in a radius of only 14 ft. . . .
with instant reverse and at 50% higher speed

When you figure how many times a day a loader backs and turns, you see how a faster reversing, shorter turning machine like this Jaeger Load-Plus gets its high production.

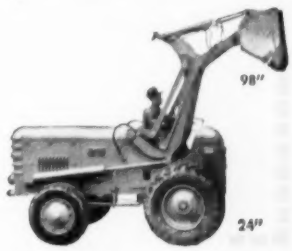
The shift of a directional lever, without any shifting of speed gears, puts it into 50% higher reverse speed. Its power-steered rear axle whirls it in a tight turn of only 14' radius at both outside rear tire and bucket corner — *2' 5" less than its overall length and 3' to 5' less than other leading loaders need to turn in.*

From there a Jaeger Load-Plus has 5 transmission speeds to take it up to 28.2 mph in reverse or up to 18.7 mph forward. Between these 5 speeds its torque converter gives you an infinite number of gear ratios for smooth acceleration, and permits instant gear shifting without risk of shock load on the power train.

Your operator can choose the most efficient speed for any condition, steer with his fingertips when in mud, snow or soft ground, work with the certainty of an always balanced machine and the sure traction of front driving wheels always located at the fulcrum of the load.

Have your Jaeger distributor show you a Load-Plus at work — or ask us for Catalog L100-3.

Load increases traction because it's centered on the driven front wheels. Hoisting crowds bucket 13" deeper into pile.



8'2" dumping clearance with 24" reach, in only 4½ seconds from "carry" position. Finger-tip hydraulic controls.

THE JAEGER MACHINE COMPANY

400 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • PUMPS • CONCRETE MIXERS • TRUCK MIXERS • PAVING MACHINES

It's a fact . . . our handy Readers' Service card is the way to get new catalogs.

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Use of Calgon To Prevent Scale Deposits

381. A convenient table outlining situations where Calgon may be used for the prevention of scale deposits and typical examples of the use of Calgon threshold treatment by municipalities is presented in an illustrated leaflet available from Calgon, Inc., Hagan Bldg., Pittsburgh 30, Pa. Check the handy coupon today.

Fundamentals of Centrifugal Pumps

300. This instructive 12-page booklet, written in simple language and illustrated with easily understood diagrams, explains the principles of operation of centrifugal pumps, defines the various terms used in pump calculations and works out typical pump problems. Get Form 7287 from Cameron Pump Dept., Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or check the coupon.

WATER WORKS

The Modern, Streamlined Elevated Tank

32. An 8-page bulletin describes the Watersphere, a modern elevated water tank of welded steel construction for general service gravity water pressure and fire protection. Construction details, illustrations of typical installations and table of standard sizes from 25,000 to 250,000 gallons capacity are included. Check the coupon. Chicago Bridge & Iron Co., 2115 McCormick Bldg., Chicago 4, Ill.

Data on Cutting-In Valves, Repair Sleeves and Accessories

33. A variety of Clow products for installation and repair of cast iron pipe lines, including the Eddy cutting-in valve and sleeve, split sleeves for pipe repair, test plugs, valve boxes, Strickler pipe cutters and other fittings and accessories are featured in literature available from James B. Clow & Sons, Inc., Box 6600-A, Chicago 80, Ill. Check the coupon.

Helpful Data on Water Works Products

49. A completely new catalog covering the entire line of water distribution and service products offered by the Mueller Company, of Decatur, Ill., is now available to engineers and water works superintendents. The 328-page catalog features an easy-to-use sectional indexing arrangement to facilitate quick reference to any of the hundreds of products listed. A large section of useful engineering information is included. Check the coupon today.

Efficient Coagulation With Ferri-Floc

69. Advantages claimed for Ferri-Floc as a coagulant include wide pH range, quick floc formation, manganese removal, control of certain tastes and odors, plus other aids in high quality water production. Check coupon for complete Ferri-Floc data. Tennessee Corp., Grant Bldg., Atlanta, Ga.

96 Page Book Helps Solve Water Problems

71. pH and Chlorine Control. A discussion of pH control and description of comparators, colorimeters and similar devices. A 96 page booklet. W. A. Taylor & Co., 7304 York Road, Baltimore 4, Md.

Useful Data on Butterfly Valves

100. Complete descriptions and tables of dimensions on the full line of Rockwell Butterfly Valves are contained in several bulletins published by the company. Construction details and special control features are illustrated. Write W. S. Rockwell Co., Eliot Street, Fairfield, Conn.

Specs for Gate Valves

112. Rigidly inspected gate valves for pressures up to 175 lbs. by R. D. Wood Co. Sizes 2" to 30", for any standard type joint. R. D. Wood Co., Public Ledger Bldg., Philadelphia 5, Pa.

Meter Features That Help Make Water Works Profitable

59. Simple design, accuracy and long life, moderate first cost and inexpensive maintenance are features of American water meters described in Bulletin No. 50 of the Buffalo Meter Co., 2917 Main St., Buffalo 14, N. Y. Be sure you have this informative booklet which gives the details of American meter design and construction plus full data on sizes, capacities and dimensions. Get your copy by checking the coupon.

Pipe Detector Determines Exact Location and Depth

120. Determination of the exact location and depth of buried pipes, valves, service cables and other metallic objects can save costly digging and unnecessary damage. Your work can be speeded when you use the Detectron pipe detector, which features simple operation, shielding to avoid static interference, economical unit construction and a lifetime guarantee. Get full data from Detectron Co., 5631 Cahuenga Blvd., No. Hollywood, Calif., by using the coupon.

Vertical Turbine Pumps For Municipal Water Supply

121. Engineering data on vertical turbine pumps for deep or shallow well operation in capacities ranging from 50 to 10,000 gallons per minute, oil or water lubricated, are covered in a booklet issued by Worthington Corp., Vertical Turbine Division, Succasunna, N. J. Check the coupon today for this helpful information.

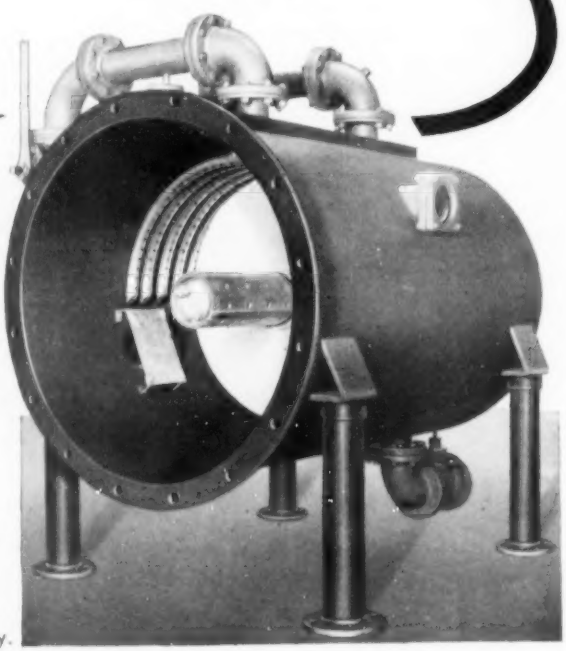
Data on the Ratochlor Chlorine Dispenser

134. Complete descriptive literature on Ratochlor chlorinators which feature corrosion resistance, safety, dependability and direct, visible flow measurement is available from Fischer & Porter Co., Hatboro, Pa. Details of operation, applications and full engineering data are furnished. Write today or check the coupon for latest information.

A new trend in municipal water filtration —

The SPARKLER DIATOMITE FILTER MODEL SCJ

has been highly successful in installations now in operation



Reduced operating cost due to long filtering cycles and fast backwash cleaning, together with a remarkably low bacteria count requiring a minimum of chlorination are features that make this new type filter worthy of the attention of all waterworks engineers.

Practically any volume of city water can be filtered economically in the Sparkler SCJ filter. Single units capable of handling 5,000,000 gallons of water a day are available. Multiple units can be engineered into a system for larger requirements.

Less than 0.2% of water is required to backwash and clean the largest filter units and a complete fresh precoat of diatomite can be applied and the filter ready to resume operation in 15 minutes.

Operators can be easily trained, no highly skilled specialized personnel is required to insure efficient performance.

Write for plans and prices on your requirements. Address Dan Baldwin for personal service.

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Manufacturers of industrial filters for over a quarter of a century.

The Davis

Pit Bull

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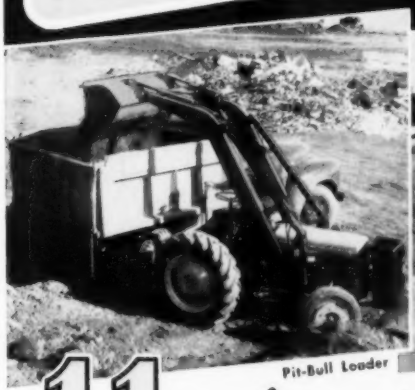
Replaces... HIGH-INVENTORY EQUIPMENT 11 TO 1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Pit-Bull Broom

Pit-Bull Back-Hoe

11 Attachments... to 1 Basic Unit

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Fork Lift

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Swinging Crane

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Rotary Mower

Model 100 Loader

Here is a low-cost single unit that fits Ford or Ferguson tractors with 11 attachments that replace high-cost industrial machines.

Any of the attachments can be fitted to the basic ***Pit-Bull*** unit in only a few minutes, and another job is underway with the same operator at the finger-tip controls.

the PIT-BULL

- ★ *Cuts Labor Cost*
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...Now, Look at Your Profit Margin

The basic ***Pit-Bull*** hydraulic power unit is attached to your Ford or Ferguson tractor by your dealer. This includes the installation of a syncro-mesh transmission with underdrive, providing four speeds in either direction and permitting you to change direction without shifting gears.

The driver's seat and steering controls are reversed, and ***Pit-Bull*** control levers installed so that the operator can manipulate the unit hour after hour *with ease and comfort.* This rear conversion enables the operator to maintain simultaneous control over the hydraulic operation and the tractor as well as to have a perfect view of the working area.

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How Accurate Boring Speeds Underground Pipe Installations

135. Interesting charts showing earth boring costs, speed and accuracy for holes from 2½" to 14½" diameter and up to 80 feet long are included in 16-page Catalog No. 8 issued by Hydrauger Corp., 681 Market St., San Francisco 5, Calif. Specifications and general operating instructions are also covered.

Engineering Data on Diatomite Filters

139. Get complete data on the Sparkler model SC-J diatomite slurry feed filter for swimming pools from the Sparkler Mfg. Co., Mundelein, Ill. Check the coupon for full information including table of filter sizes and capacities, space required and filter operation.

Faster Pipe Laying With Precaulked and Threaded Joints

148. McWane 2" cast iron water pipe with threaded joints and precaulked bell and spigot pipe are described in folder WM-47. Additional data on 3" to 12" centrifugally cast pipe and fittings in folder WL-47, both issued by McWane Cast Iron Pipe Co., Birmingham 2, Ala.

Non-Clogging Vertical Wet-Pit Pump Described

182. Full engineering data on Worthington "Freeflo" wet-pit pumps with non-clogging impellers capable of passing solids and stringy material are included in Bulletin W-317-B12. Check these pumps for sump, sewage and drainage service. Bulletin available from Worthington Corp., Harrison, N. J. Just use the coupon.

Engineering Data On Mechanical Joint C.I. Pipe

183. General specification, weights and dimensions of mechanical joint cast iron pipe and fittings are furnished in a 32-page booklet issued by Alabama Pipe Co., Anniston, Ala. Get this helpful data by checking coupon.

Locate Mains, Services and Leaks Without Digging

186. A 16-page booklet tells how to use the Fisher "M-Scope" to locate buried pipes, cables, valves, manhole covers, conductive and non-conductive sewer pipes and septic tanks by electronic means. Dry battery operated. Only one man is needed for operation. Get data from Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif., by checking the coupon.

Data Offered on Ford "Kornerhorn"

195. For basement meter settings, the Ford Meterbox Co., Inc., Wabash, Ind. now offers the Kornerhorn which gives all the benefits of the successful Copperhorn and in addition eliminates pipe threading and may be fit into tight corners. May be used with one or two valves. For specifications and pictures of step-by-step installation get bulletin by checking the coupon.

Complete Catalog and Reference Data on Valves and Fittings

211. The entire M & H line of valves, fittings and accessories for water works, filtration, sewage disposal and fire protection are illustrated and fully detailed in Catalog 52 issued by M & H Valve & Fittings Co., Anniston, Ala. In addition to complete data on these products, there are many pages devoted to helpful engineering data. Every designer should have a copy. Get yours by checking the coupon.

Water Conditioning Data Book Offered To Engineers

259. All engineers and municipal officials concerned with water conditioning will want a copy of the greatly enlarged edition of the popular Permutit Data Book prepared by the Permutit Co., 330 West 42nd St., New York 36, N. Y. This completely revised book presents a compilation of 78 tables, all valuable to the engineer. Subjects include hydraulics, impurities in water, reactions and conversions of chemicals used in water treatment, alkalinity relationships and other helpful material.

Makes Underground Pipe Installation Easy

115. One-man operated hydraulic pipe pusher pushes pipe through ground under streets, sidewalks, lawns and other obstacles. Pays for itself in man hours saved on first few jobs. For complete facts ask for Form E-213, Greenlee Tool Co., Rockford, Ill. Just check the coupon.

Helpful Data on Sluice Gates

158. In a well-organized 48-page catalog you will find complete engineering and design data on Pekrul sluice gates, headgates, automatic flap gates, lifts and accessories. Numerous models in 6" to 92" sizes are available, and all pertinent data will be found in this helpful booklet. Write Morse Bros. Machinery Co., Denver, Colo., or use the coupon.

Water Lines Under Pavements Easily Installed

247. With a Trojan pipe pusher and puller no resetting of grip is required, so the work goes twice as fast. Two models, for pipe up to 2" dia. Get full details by checking the coupon. Trojan Mfg. Co., 1114 Race Dr., Troy, Ohio.

All About Centrifugal Pumps

361. Where pumping performance counts you want to check your specifications carefully. Investigate the features of Fairbanks-Morse centrifugals. Use coupon or write to Fairbanks, Morse & Co., Dept. P. W., Chicago 5, Ill.

Boltless Tapping Sleeves Speed Installations

370. Boltless tapping sleeves for cast iron and asbestos-cement pipe offer top economy by eliminating caulking, cutting down excavation and speeding up installations. Be sure to investigate this new product. Write Corey Mfg. Co., 329 Verdugo Rd., Los Angeles 65, Calif., or check the coupon.

VERSATILITY is the keynote in SHAWNEE EQUIPMENT

HYDRO-CLAM CONVERTS TO BACKHOE SIMPLY BY CHANGING BUCKET BOOMS

Ideal for large and small operators—Municipalities and Counties.

AVAILABLE FOR MOST ALL TRACTORS—One machine...convertible to perform two types of digging! This practical feature was first requested by owners of Shawnee equipment—Now it is fulfilled. It means greater economy and increased versatility—from digging long trenches 10" to 20" wide the machine can be converted to the clam for spot excavations (36-in. minimum) in just a few minutes time.

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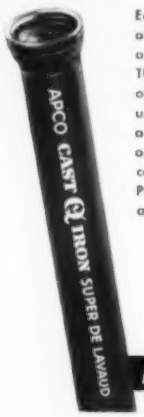

Each length of pipe we manufacture passes through the above hydrostatic test press where it is filled with water and the pressure raised to 500 pounds per square inch. The most common water works pipe is designed for an operating pressure of 150 pounds per square inch. This undergoes the 500 pounds per square inch hydrostatic test and permanent records for each piece of pipe are kept on file for inspection by our customers at all times. You can be assured with Alabama's Super De Lavaud Cast Iron Pipe. In sizes of 3" to 24" in modern long lengths. Bell and Spigot, Mechanical Joint and Flanged Pipe.

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ALABAMA PIPE COMPANY

ANNISTON ALABAMA

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HOW THE MAIN FRAME CONTRIBUTES TO TOP TRACTOR PERFORMANCE

One of the big reasons why more and more Allis-Chalmers tractors are being used today is their exclusive main frame design.

These frames are one-piece, all-steel welded structural members (like the girders in a bridge or the columns in a building). They help provide greater strength and flexibility to withstand shock loads . . . make possible better equipment mounting, improved weight distribution and outstanding service simplicity as well.

We invite you to see these advantages . . . first at your nearby Allis-Chalmers dealer . . . and then in a demonstration.

"ROLLS WITH THE PUNCH" — All-steel main frame flexes slightly under extreme shock loads . . . without transmitting strain to engine, clutch or transmission.

BETTER EQUIPMENT MOUNTING — This frame's compactness provides ample clearance for equipment like front-end shovels . . . permits wide track shoes . . . improves performance of entire unit.

IMPROVED WEIGHT DISTRIBUTION — Box A-frame allows location of main components for best over-all balance . . . putting more weight lower in tractor where it does the most good.

SERVICE SIMPLICITY — Since main frame carries *structural* load, power drive components can be readily removed, repaired or replaced without disturbing adjacent parts.

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TRACTOR DIVISION—MILWAUKEE 1, U.S.A.

Get full details of this month's products . . . mail your Readers' Service card today.

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Investigate This Compact Flow Meter for Water

226. The Foster "Flow Tube" is a metering element that is compact and easy to install. Bulletin FT illustrates simple element containing nozzles for differential pressure production and shows capacity range and accuracy. Made in standard type sizes. Foster Engineering Co., Union, N. J. will send copy, or use coupon.

Helpful Data On Pipe Tools

230. Toledo drop head ratchet threaders are light, compact, ideally suited for work in tight corners. Three models for ⅛" to ¾"; ⅛" to 1¼"; and ½" to 2" pipe all feature quick change of sizes. Get Catalog 12A53 from Toledo Pipe Threading Machine Co., Toledo, Ohio. Check the coupon.

Helpful Valve Catalog For Engineers

236. For complete descriptions of Darling double disc, parallel seat gate valves be sure to get Bulletin 5002 issued by Darling Valve & Mfg. Co., Williamsport, Pa. Construction details covering all valve parts and accessories are helpful for specification writers. Check the coupon for your copy.

Helpful Data on Butterfly Valves

238. A comprehensive catalog which furnishes full data on the design and application of Pratt Rubber Seat Butterfly Valves has been made available to designers and engineers by Henry Pratt Co., 2222 So. Halsted St., Chicago 8, Ill. Check the coupon for your copy of this excellent source of practical information.

General Catalog on Measuring and Controlling Equipment

272. The full line of Simplex equipment for the measurement and control of liquids and gases in water and sewage plant installations is illustrated and described in detail in 28-page Catalog 004. Every engineer should study the design data in this helpful booklet. Write Simplex Valve & Meter Co., 68th & Upland Sts., Philadelphia 42, Pa., or use the coupon.

Reference Book on Lubricated Plug Valves

273. Lubricated plug valves, including stick-proof lever sealed valves for easy operation and positive mechanical seal are fully described in reference books issued by Homestead Valve Mfg. Co., Box 550, Coraopolis, Pa. Check the coupon for your copy.

Standard Specifications for C. I. Pipe and Fittings

278. Standard dimensions for cast iron water pipe and special castings are available in a convenient booklet offered with the compliments of U. S. Pipe and Foundry Co., Birmingham 2, Ala. Get your copy by checking the coupon.

Technical Bulletin on Solenoid Operated Valves

288. Full technical data on application, construction, dimensions and specications of Golden-Anderson Cushioned solenoid operated valves is contained in Bulletin W-7, available from Golden-Anderson Valve Specialty Co., 1232 Ridge Ave., Pittsburgh, Pa. Selected valve patterns are offered in ½ to 2-in and 2½ to 36-in. sizes. Get all the details; just check the coupon.

Controller Maintains Water Level In Treatment Basins

348. Instrumentation which maintains liquid level in sedimentation basins, and thus controls level in succeeding treatment basins, is described in Application Engineering Data Sheet No. 831-20, issued by The Foxboro Co., Foxboro, Mass. All components are described in the illustrated data sheet. Get your copy by checking the coupon.

Factors to Consider in Elevated Tank Selection

299. Details on the several different types of elevated steel tanks, including capacity ranges, tank dimensions and other factors to be considered in the selection of elevated tanks for modern water storage, plus discussions of new tanks for old towers and foundations are included in Bulletin 101 of the Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa. Check coupon for your copy.

Trencher Fits Municipal Needs

315. A bulletin describing the Cleveland Model 95 trencher has been published by the Cleveland Trencher Co., Cleveland 17, Ohio. The Model 95, called "The standard machine for city and suburban work", is versatile, maneuverable and economical for use on water lines, service lines, road widening and all utilities trenching. Get this 8-page illustrated bulletin by checking the coupon.

Convenient Data on Water Works Fittings

327. Complete data on water works brass goods and allied fittings, including curb stops, corporation stops and couplings, lead goosenecks, meter fittings, service boxes and drilling and tapping machines is furnished in convenient form by Hays Mfg. Co., Erie, Pa. Be sure you have this information in your files. Check the coupon.

Helpful Data on Water Meters

330. It is to the interest of every water works superintendent and engineer to have full data on dependable Badger water meters and related meter products. Complete data on all types of disc, turbine and compound meters, meter test equipment, yokes, strainers and alarm registers are supplied in an attractive binder by Badger Meter Mfg. Co., Milwaukee 45, Wis. Check the coupon for your copy.

LARGE BOULDERS NO PROBLEM FOR "Flexibles" AT SANDFORD, MAINE

From Sandford, Maine, to San Diego, California—from Seattle, Washington, to Miami, Florida, "Flexible" Equipment provides the answer to general and specific sewer-cleaning problems.

Sandford, Maine, for example, has been buying "Flexible" pipe-cleaning tools since 1936. Here one of the principal problems is bringing out large boulders that clog storm drains. And here is photographic "proof positive" that "Flexible" Bucket Machines get them out.

This photograph was taken some years ago. Since then "Flexible" Bucket Machines have been importantly modernized and improved in line with our constant study of sewer-cleaning needs and advanced engineering methods. We invite an "on the job" demonstration.

Write for our **FREE** *Catalog*

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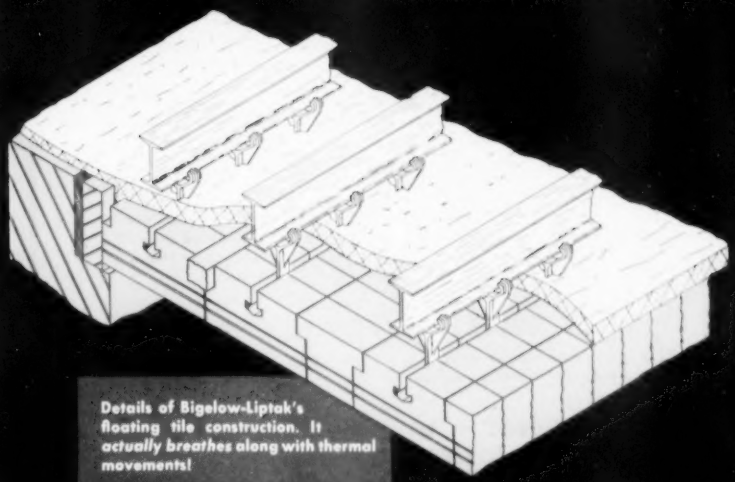
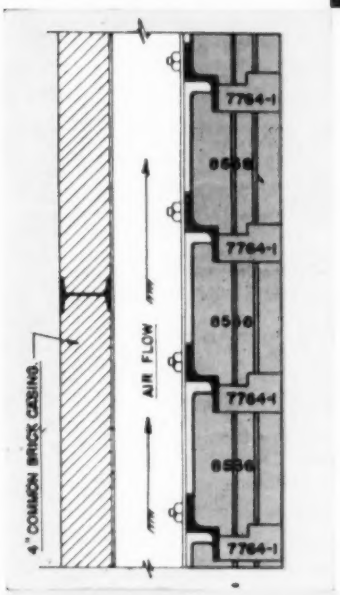
AMERICA'S LARGEST LINE OF PIPE CLEANING TOOLS AND EQUIPMENT

Suburban Detroit's New Incinerator . . . . WILL BE TOUGHER THAN BLAZES!



Details of Bigelow-Liptak's floating tile construction. It *actually breathes* along with thermal movements!



Cross section of B-L's wall construction. Note how heavy, heat-resisting castings support the tile.

City planning engineers and consultants will be vitally interested in the fact that Bigelow-Liptak's unique, unit-suspended design for furnace walls and arches makes incinerators "tougher than blazes" too.

Proof of that fact lies in the many B-L installations which dot the country. Right now, in suburban Detroit, Michigan, construction is underway on a large incinerator which features the B-L design.

In a nutshell, unit-suspended construction provides longer, trouble-free life at a lower, overall cost.

Here's why:

1. Each tile is individually supported—there's no "stacked up" burden caused by the ones above it. Thermal expansion is confined to individual tile. Mechanical spalling caused by pinching, buckling, etc. is eliminated. That adds up to no cumulative loading or expansion.
2. If repairs ever become necessary, any small section of tile can be removed and replaced without disturbing adjacent areas. This cuts the size of the repair job as all other areas—above, below, at the sides—need not be touched.

Remember: you'll pay less in the long run. Countless installations in boiler houses, oil refineries, metallurgical furnaces—wherever heat must be controlled—have proven that fact. Write for information—today.

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—Can be used with confidence by anyone. Kills *all* vegetation by contact and translocation to weed roots; sterilizes the soil. RESULTS APPARENT IN A FEW DAYS. Spray, sprinkle or use as *dry powder*—"built-in" wetting and spreading agent works *fast* by wetting waxy surfaces of plants and inducing penetration into leaves, stems, roots. Non-inflammable, non-volatile, non-corrosive.

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—Where NO vegetation is desired . . . on walks, drives, areas close to buildings. Tends to sterilize the soil so that wind-blown seeds cannot germinate.

DOLGE E. W. T. 40- 2, 4-D *SELECTIVE* WEED-KILLER

—*Will not harm good lawn grasses, but kills dandelions, plaintain and other broad-leaved noxious plants in turf.*

Write for Dolge booklet on chemical weed control, and see your DOLGE SERVICE MAN for practical weed control advice.

Ask about SOLEXTO
Kills grubs of turf insects —one application protects lawns for years!

dependable DOLGE
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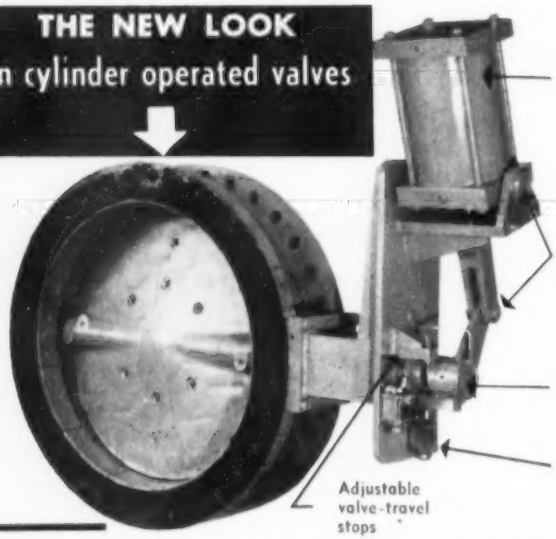
THE NEW LOOK in cylinder operated valves


Front-trunnion mounted hydraulic cylinder operator
Stainless steel pinned connections
Valve Position indicator
Limit switches for remote valve position indication
Adjustable valve-travel stops

- Low head loss characteristics, coupled with long life "bottle tight" shutoff, makes Henry Pratt Butterfly Valves ideally suited for Waterworks applications.
- Long-life resilient seat assures continued "bottle tight" shutoff.
- Compact trunnion-mounted design requires unusually small amount of head room.
- Furnished in both 50# and 125# design classes.
- Available in valve sizes from 10" to 168".

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New Advantages In Boiler Construction

309. Get the latest data on cost-saving tube-supported wall enclosures for large and small boilers from Bigelow-Liptak Corp., 2550 W. Grand Ave., Detroit 8, Mich. 12-page booklet gives full details. Check the coupon today.

Get Comprehensive Data On Johns-Manville Products

338. A new 40-page Industrial Products Catalog which offers essential data on asbestos-cement pipe, packings, insulations, construction materials and numerous other products is now available from Johns-Manville, 22 East 40th St., New York 16, N. Y. You will find this compact catalog a valuable reference item. Check the coupon for a copy.

Job Data Offered on New Steel Water Mains

342. A 16-page illustrated report listing construction details on steel water lines is entitled "Dresser Coupled Steel Water Lines in the Year 1952." Get your copy from Dresser Mfg. Div., 59 Fisher Ave., Bradford, Pa. by checking the coupon.

●

STREETS AND HIGHWAYS

Levels Sidewalks and Curbs Quickly and Easily

29. How the Mud-Jack Method for raising concrete curb, gutter, walks and streets solves problems of that kind quickly and economically without the usual cost of time-consuming reconstruction activities—a bulletin by Koehring Company, 3026 W. Concordia Ave., Milwaukee 16, Wis. Check the coupon.

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30. Fast, versatile Wood's rotary mowers are available in nine models, 42" to 114", to suit all types of municipal maintenance. Upkeep costs for roadside mowing, brush cutting, leaf mulching, park maintenance, airport maintenance, can all be reduced with efficient equipment. Get full details by checking the coupon. Wood Bros. Mfg. Co., Box 148B, Oregon, Ill.

Hoist Equipment and Catch Basin Cleaners for Public Utilities

54. The complete line of Silent Hoist winches for trucks and tractors, "Krane Kars", truck towers, catch basin cleaners and other equipment of interest to municipalities are illustrated in Bulletin 54A. Use coupon or write to Silent Hoist & Crane Co., 844 63rd St., Brooklyn 20, N. Y.

Concrete Saw Cuts Patches, Trenches, Contraction Joints

85. Savings of up to 50% in labor and materials is claimed by sawing repair patches or trenches for sewer, water, gas lines in concrete or asphalt. In new concrete construction sawed joints control contraction cracking and eliminate costly hand formed joints. Full information on how you can economically saw concrete from Clipper Mfg. Co., 2823 Warwick, Kansas City, Missouri. Check the coupon.

Uniform Salt and Cinder Spreading at All Speeds

93. Be sure to investigate the hydraulically operated ground drive offered by Baughman to give you the advantages of two drive speeds and uniform distribution of material regardless of truck speed, but without the need for power takeoff or transmission. Full data on this and many other features in Form A-380. Baughman Mfg. Co., Jerseyville, Ill.

Patching and Maintenance With Bitumuls

283. Proper maintenance of paved surfaces is the subject of an informative 24-page booklet "Bitumuls for Maintenance" published by American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 4, Calif. Profusely illustrated and well-written, this text gives step-by-step descriptions of patching and other surface maintenance operations. Check the coupon now to order your copy.

WRIST-ACTION DIPPER GIVES NEW ANGLE TO TRENCH DIGGING, ADDS 50% MORE POWER!

Note how wrist action brings dipper mouth in "face-up" position — helps keep big loads from spilling. Wrist-action dipper is available in 18-in. and 12-in. dipper widths.

BUCYRUS-ERIE OFFERS another outstanding feature in dragshovel performance — the wrist-action dipper. Dipper is hinged at lower end of dragshovel handle and rotates in a vertical plane through an arc of 65 degrees, from a position 25 degrees ahead of handle to 40 degrees behind it.

Wrist action permits operator to vary the dipper's position so that dipper teeth bite into ground at best digging angle. You not only get bigger loads but also less spillage because dipper can be rotated to best carrying position. Wrist action provides these additional advantages, too:

1. Actual increase of 50% more power delivered at dipper lip — means up to 6 tons of tooth force.

2. The wrist-action Hydrohoe can dig a vertical wall or short, deep trenches (deeper than they are long) with virtually no hand work; dig column footings; cut trenches 12 to 24 inches wide by as much as 13 feet deep.

3. By working wrist action along with boom telescope, operator can pry out rocks and expose buried pipe with far less danger of pipe damage.

4. Wrist-action dipper rotates past stationary door providing automatic ejection of sticky materials — results in more and bigger payloads.

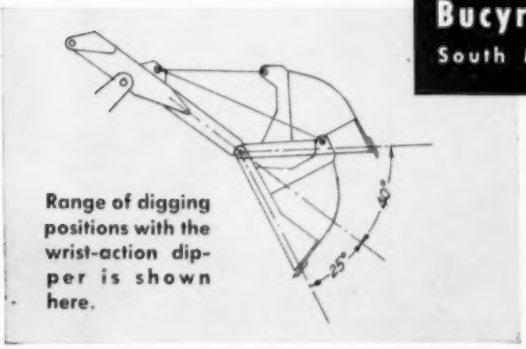
5. Over-all performance is improved by increasing power available at dipper. You have to see this wrist-action dipper in operation to see how it bites in and pries its way through tough clay. It's a real time and money saver.

BUCYRUS ERIE

QUICKLY CONVERTIBLE TO HYDROCRANE IN FIELD

The hoe boom is quickly convertible to crane front end right in the field. With telescoping crane boom this machine has proved outstanding for unloading and laying pipe. Owners say there's nothing like it on pipe handling work.

Get full details on the new Hydrohoe wrist-action dipper and the versatile Hydrocrane. Learn how attachments can be interchanged in minutes. Send coupon today.



Range of digging positions with the wrist-action dipper is shown here.

Bucyrus-Erie Company
South Milwaukee, Wisconsin

Gentlemen:
Please send me details on the new Hydrohoe ☐
Hydrocrane ☐

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Organization.....

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City..... State.....

9H54

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HOW TO LOCATE WATER LEAKS

...with Simplex Pitot Equipment

WHY not decrease your load and stop pumping to waste? Locate the hidden leaks which waste thousands of gallons per day per mile of main . . . far more than usually guess-timated!

Locating these leaks with Simplex Pitot Equipment costs only a tiny fraction of the value of the water being wasted. You get accurate flow records with minimum effort . . . valuable data that will help you to reduce "unaccounted-for water" to a minimum.

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Simple, rugged and lightweight. Easily installed on any pipe or main. Special clamp holds tube firmly in position against water pressure.

Low coefficient gives high differential pressure for greatest accuracy.

MANOMETER

Quickly connects to a Simplex Pitot Rod with flexible tubing. You then have a simple, sensitive and inexpensive instrument for indicating rate of flow.

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PITOT RECORDER

Connects easily to Pitot Rod. Eight-inch chart records flow data. Simple and rugged construction . . . no delicate mechanisms...yet sensitive and accurate.

Sturdy carrying case. Leveling feet. Reliable 7-day clock movement for chart. Accurately calibrated.

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Free 20-page Technical Bulletin 1300. Full instructions for use and care of Pitot equipment. Seven pages of helpful formulae, tables, curves. Write to Simplex Valve & Meter Co., 6750 Upland St., Philadelphia 42, Pa.

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Get full details of th's month's products . . . mail your Readers' Service card today.

Grading Can Be Faster, Cheaper and Easier

96. You'll like every feature of the Austin-Western 99H Grader. It has all-wheel drive, all-wheel steer, controlled traction, precision sideshift and a high lift, extreme reach, reversible blade. Get data from Austin-Western Co., Aurora, Ill.

How to Save Time on Curb and Gutter Work

143. Every type of curb and gutter work is illustrated in the 12-page Heltzel catalog on steel forms for building concrete curbs, gutters and sidewalks. Time-saving setups show how to speed up the job and save money. Get your copy from Heltzel Steel Form & Iron Co., Dept. PW, Warren, Ohio.

Black-Top Paver Offers Many Advantages

150. The flexible Adnun Black Top Paver lays any asphalt mix, hot or cold, in widths from 6 ft. to 13 ft. Careful design lowers operating cost and cuts maintenance. Attachments spread stone, cinders or slag. Get full data on this machine by checking coupon. The Foote Co., 1954 State St., Nunda, N. Y.

Versatile Maintainer Has Year 'Round Usefulness

151. The sturdy Huber Maintainer will work for you the year 'round on maintenance jobs, berm leveling, road planning, bull-dozing, snow plowing, brooming, mowing shoulders and as a patch roller. Good ideas on how to do all these jobs in Bulletin No. M-138. Write Huber Manufacturing Co., Dept. PW, Marion, Ohio.

Better Highways Through Salt-Soil Stabilization

162. Practical information for the men who build, repair and maintain our highways is provided in two bulletins issued by the International Salt Co., Inc., Scranton, Pa. General principles of salt-soil stabilization, applications, plant mix and road mix are described. Check the coupon for your copies.

Speed Concrete Removal And Make Better Patches

202. Felker self-propelled concrete cutters saw to 6½" depths to facilitate concrete removal and produce smooth, straight edges which resist spalling when patched. Full data on cutters and segmented type diamond abrasive wheels are available from Felker Mfg. Co., Torrance, Calif. Check the coupon today!

Light Weight Machines Do Work of Heavy Rollers

204. For compacting hot or cold patching material, granular soils, macadam construction, and other applications where controlled densities are required, be sure to investigate Jackson electric vibratory compacting equipment, available in 12 in. to 12 ft. widths to meet all requirements. Get details in Bulletin 153 by checking the coupon. Jackson Vibrators, Inc., Ludington, Mich.

New Ease in Concrete Sawing

212. The Eveready "Powr-Drive" saves operator effort and increases cutting footage by controlling speed according to various requirements. Get full data on Eveready concrete saw with "Powr-Drive" from Eveready Briksaw Co., 1509 S. Michigan Blvd., Chicago 5, Ill. Use the handy coupon today.

Get Full Data On Aggregate Spreaders

286. Accurate control for spreading crushed rock, chips, sand or ice control materials is featured by all models of Highway Equipment Co. materials spreaders. Data on both trailer and tailboard types available by checking the coupon. Highway Equipment Co., 630 D. Ave., Cedar Rapids, Iowa.

The Bros Line of Road Machinery

289. An illustrated folder describing the Bros line of road machinery is available from Wm. Bros Boiler & Manufacturing Co., Minneapolis 14, Minn. Full descriptions of Bituminizer distributors, Spraymatic spray bars, several types of compacting equipment and other units are included. Check the coupon.

Barber-Greene DITCHERS

DIG IN ANY SOIL . . .
ANY TIME OF YEAR . . .
FOR THE LOWEST COST PER FOOT OF TRENCH

Year-round utility makes B-G Ditchers favorites everywhere. Advanced features include the exclusive Vertical Boom that permits digging right up to walks, foundations, other obstructions, leaving no ramp . . . the milling action of the fast moving, closely spaced buckets that cut through coral, frozen ground, asphalt pavement . . . the overload release that slips when overload occurs, automatically re-sets itself.

ONLY B-G HAS THE

VERTICAL BOOM

BG Model 44-C

Heavy-duty, full crawler mounted. Cuts to 8'3" deep, 24" wide. Adjustable grade indicator. Follow-up scraper. Adjustable spoil conveyor discharges to either side. Replaceable digging teeth. Power boom hoist for instant control of Vertical Boom.

BG Runabout

Model 705B Service Ditcher. Combination of exclusive *Hydra-Crowd* and *Fluid Drive* transmission offers new operating advantages. New, curved, reversible insert teeth last 3 to 5 times longer. Pneumatic tired, travels at 15 m.p.h. One-man operation.

Barber-Greene BG

Aurora, Illinois, U. S. A.

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Use Hot Patch Material On All Maintenance Jobs

297. With the Barber-Greene Mixall you can get hot patch material wherever and whenever you need it for all maintenance jobs. Send for new 8-page bulletin that gives full information on this small, highly portable unit that turns out all types of bituminous patch material in any quantity you need. Write Barber-Greene Co., Aurora, Ill., or use the coupon.

How the Mobil-Sweeper Can Improve Street Sweeping

305. Sweeping costs can be cut with the Mobil-Sweeper which features safe highway speeds up to 55 mph, carries 2 2/3 cu. yd. dirt hopper, sweeps swath up to 10' wide with full floating brooms. Hills and deep gutters are no obstacle. Write to The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif. or use coupon for complete details on this machine.

Think of Aerial Surveys When You Need Maps

311. Every engineer and public official should investigate aerial surveys for maps of new areas, up-to-the-minute maps for city planning, highway relocation, surveys to plan extensions of sewers, water mains and utilities. Precise contours for topographic maps and other data in any detail desired can be furnished by Aero Service Corp., 236 Courtland St., Philadelphia 20, Pa. Interesting booklet on aerial mapping services and methods available by checking the coupon.

Cut the Cost of Road Rehabilitation

332. Be sure to investigate the Hetherington & Berner "Moto-Paver," the machine that does a complete mixing and laying job in one continuous operation. Specifications and complete information on both standard and heavy-duty models is provided in Bulletin MP-53. Get your copy from Hetherington & Berner, Inc., Indianapolis, Ind., or check the coupon.

SEWERAGE AND WASTE TREATMENT

What You Should Know About Trickling Filter Underdrains

20. Specifications for vitrified clay underdrain blocks conforming to ASTM standards, suggestions for layout and construction of trickling filter floors, dimensions of standard blocks, channel covers, angles and other fittings are available from the Trickling Filter Floor Institute, c/o Editor, Public Works, 310 E. 45th St., New York 17, N. Y. Check the coupon and we will forward your request.

How Cities Clean Sewer Lines From Street in One Operation

25. In a helpful 28-page handbook of sewer cleaning methods and equipment the makers of OK Champion sewer cleaners give full details of power and hand operated models. Also included are data on expansion buckets that take dirt from sewer to street in one operation, root cutters and other accessories. Get your copy by checking coupon. Champion Corp., 4752 Shelfield Ave., Hammond, Ind.

Packaged Sewage Treatment— Just Right for Small Places

36. "Packaged" Sewage Treatment Plants specifically developed for small communities—100 to 3,000 population. Write for full description and actual operating data for this type of plant. Chicago Pump Co., 622 Diversey Pkwy., Chicago 14, Ill.

How to Make Better Sewer Pipe Joints

37. How to make a better sewer pipe joint of cement—tight, minimizing root intrusion, better alignment of joint. Permits making joints in water-bearing trenches. General instructions issued by L. A. Weston Co., Dept. P.W., Adams, Mass.

A Handbook of Sewer Cleaning Methods and Materials

44. Complete, easy-to-follow directions for every type of sewer cleaning operations and the equipment needed for effective cleaning work is covered in a 40-page booklet issued by Flexible Sales Corp., 3786 Durango, Los Angeles 34, Calif. Full details are provided on power cleaning machines, the SeweRodeR, hand tools and all accessories. Water main and culvert cleaning methods are included. Check the coupon for your copy of this helpful handbook.

Helpful Design Data For Sewage Ejectors

81. The application and advantages of pneumatic sewage ejectors are outlined in a new bulletin of the Blackburn Smith Mfg. Co., Inc., Hoboken, N. J. Included are piping diagrams for electrode and float switch controls plus dimensions and layouts for single and duplex systems. Get your copy by checking coupon.

What You Should Know About Design and Use of Concrete Sewers

122. Every engineer and contractor should have a copy of the 48-page book "Concrete Sewers" in his library. This valuable text, published by the Portland Cement Assn., 33 W. Grand Ave., Chicago 33, Ill., gives an authoritative discussion of hydraulics, sewer design, construction and maintenance. Generous use of helpful illustrations makes the book attractive and helpful to the reader. For your copy, just check the handy coupon.

How to Dispose of Sewage and Industrial Sludges

281. Get full information on the C. E. Raymond System of combined incineration and sludge drying providing high temperature deodorizing for nuisance-free sludge disposal. Flexible layouts fit large and small communities. Use handy coupon or write Combustion Engineering Inc., Raymond Div., 200 Madison Ave., New York 16, N. Y.

As a portable mix plant on rubber tires, Kwik-Mix Bituminous Mixer is easily towed to the job, gives "curb service" mixing anywhere around town. Does direct pouring on street patchwork, loads wheelbarrows. Or, with tower attachment, you get discharge heights up to 8¾-ft., for stockpiling materials or loading into trucks. Mixer also is readily adaptable as stationary elevated plant, mounted on skids. 2 sizes: 10 and 14 cu. ft. Check all the operating advantages, and heavy-duty features with your Kwik-Mix distributor . . . or write to us for catalog.

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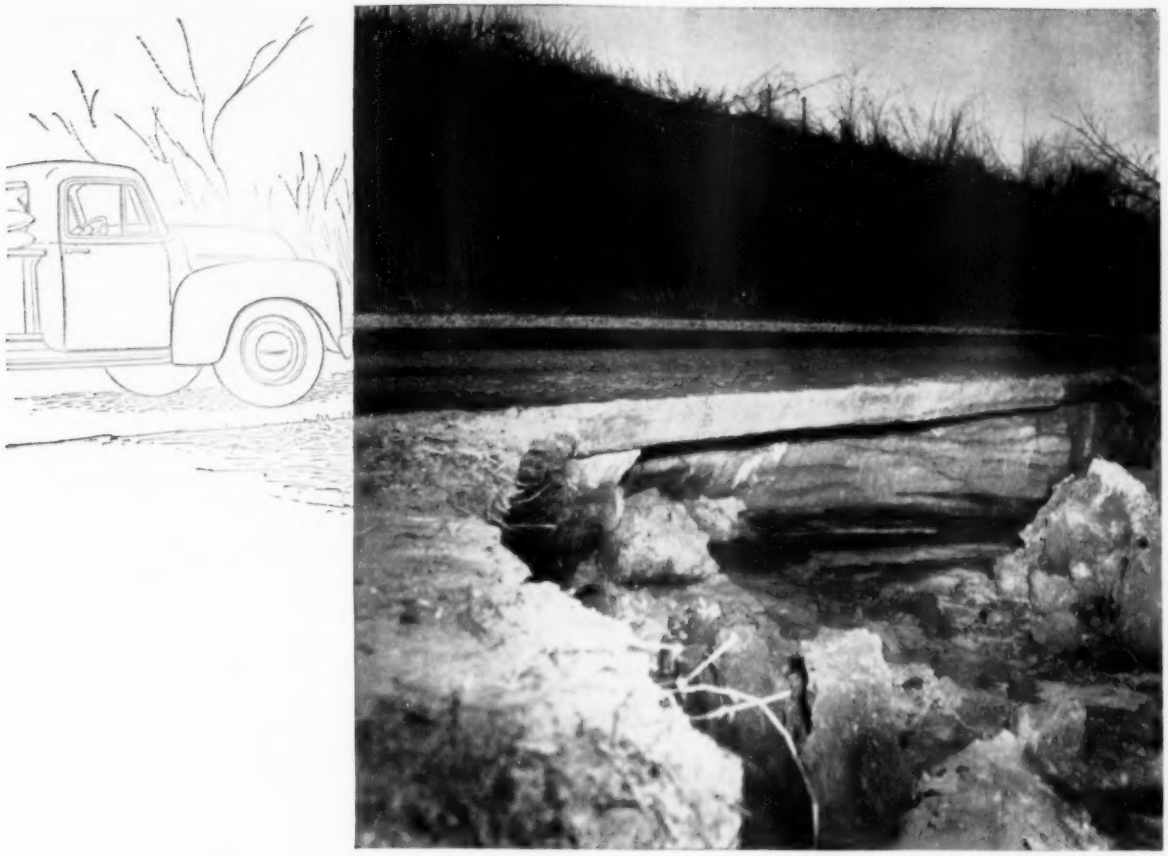

Highway Washout Demonstrates the Stability of SOIL-CEMENT Pavement

This photograph is a graphic demonstration of how stable soil-cement pavement* is. It shows a soil-cement base bridging a gap about 8 ft. long and 4 to 5 ft. wide after a storm washed out the subgrade.

The washout shown occurred on Cotton Grove Road in Madison County, Tenn. The unsupported span of soil-cement base carried normal traffic for some time before the washout was discovered and the section blocked to traffic. The 6-in. soil-cement pavement showed no damage.

Soil-cement has established a record for durability and economy for light-traffic, low-cost roads and streets. Thousands of miles of dependable, all-weather soil-cement pavements are now in use all over America. Many have served for 10, 15 and more years with little maintenance expense.

Soil-cement roads and streets are economical because (1) about 85 per cent of the required material is usually soil on or near the site and (2) they are easy and fast to build. For more information write today for free illustrated literature, distributed only in the United States and Canada.

*Soil-cement pavement consists of a soil-cement base and a bituminous surface.

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FOR WATER AND SEWAGE PIPE LINES

POSITIVE CONTROL TIGHT SHUT-OFF

This W. S. Rockwell 10"-125 lb. cast steel Butterfly Valve, used in the undersluice discharge of a water reservoir dam, shuts off by hydraulic cylinder against a water pressure of 52 p.s.i. It is but one of many types used in handling water or sewage.

Whether all metal or rubber-lined, W. S. Rockwell valves are made in pipe sizes to 132", with manual or automatic control, to meet required operating conditions.

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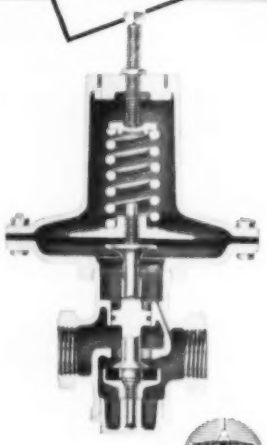
FOSTER TYPE U PRESSURE REGULATORS



Foster Type U Pressure Regulators are rugged. They are precision and quality built, insuring years of dependable trouble-free service for Water and other Public Works Departments. The balanced type of design allows for variations in the inlet pressure and provides greater sensitivity to the valve action, assuring accurately controlled pressure from zero to maximum flow.

Foster Type U Valves are used principally on water supply systems, commercial and apartment buildings, and many industrial uses such as bottle washing machines, air service supplies and air and fuel supply lines. Available entirely self-contained, piston operated, diaphragm actuated, or internally pilot controlled. Sizes ½" to 8". Write for Bulletin U-101.

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AUTOMATIC VALVES • SAFETY VALVES • FLOW TUBES

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A Short Course In Pipe Jointing

169. The story of rubber couplings for clay and concrete pipelines is graphically presented in the booklet "Pipe Enterprise", published by Hamilton Kent Mfg. Co., Kent, Ohio. Detailed description of pipe jointing methods; photos showing jobs where Tylox gaskets met the need for easily assembled, permanently tight joints installed under all conditions; and a report on the development, manufacture and outstanding features of the compression type gasket make this booklet valuable to every engineer and contractor. Check the coupon for free copy.

Complete Catalog for Engineers Shows Water and Sewage Plant Equipment

191. The complete line of Jeffrey equipment for treatment of water, sewage and industrial wastes is covered in 52-page Catalog 853. Detailed information is provided on bar screens, grinders, grit collectors, "Jigrit" washers, sludge collectors, feeders, conveyors and other related units. Photos and drawings of installations plus capacity tables complete this valuable booklet. Use coupon or write Jeffrey Mfg. Co., 947 N. 4th St., Columbus 16, Ohio.

Modern Methods and Materials For Joining Sewer Pipe

227. In a compilation of reprints and related supplementary material, the Atlas Mineral Products Co., Mertztown, Pa., presents a comprehensive review of all types of sewer jointing materials and methods. You will find this interesting and informative reading. Get a copy by checking the coupon.

Data Offered on Water, Sewage and Waste Treatment Equipment

263. Equipment for sewage treatment, water purification and industrial waste treatment is described in a 16-page Book No. 2440, published by Link-Belt Co., Colmar, Pa. Case histories, photographs and schematic drawings are included. Straightline and Circuline collectors, Thru-Clean and Straightline bar screens, Tritor screens, flash mixers, scum breakers and other units are described. Check the coupon for your copy.

Chemicals Used in Water, Waste and Sewage Treatment

276. A new chart giving information on the form, weight, solubility, strength and use of common water, sewage and waste treatment chemicals is available from Wallace & Tiernan, 25 Main St., Belleville 9, N. J. Data on materials suitable for handling each chemical in either its dry or solution form are included. Check the coupon today.

Cleaning Service for Every Type of Pipe Line

302. Flexible Pipe Cleaning Co., operating with specialized equipment and trained crews, is prepared to remove scale, rust and other deposits from pipes for every type of service. For details and estimates furnished without obligation write Flexible Pipe Cleaning Co., Box 167, Los Nietos, Calif. or check the coupon.

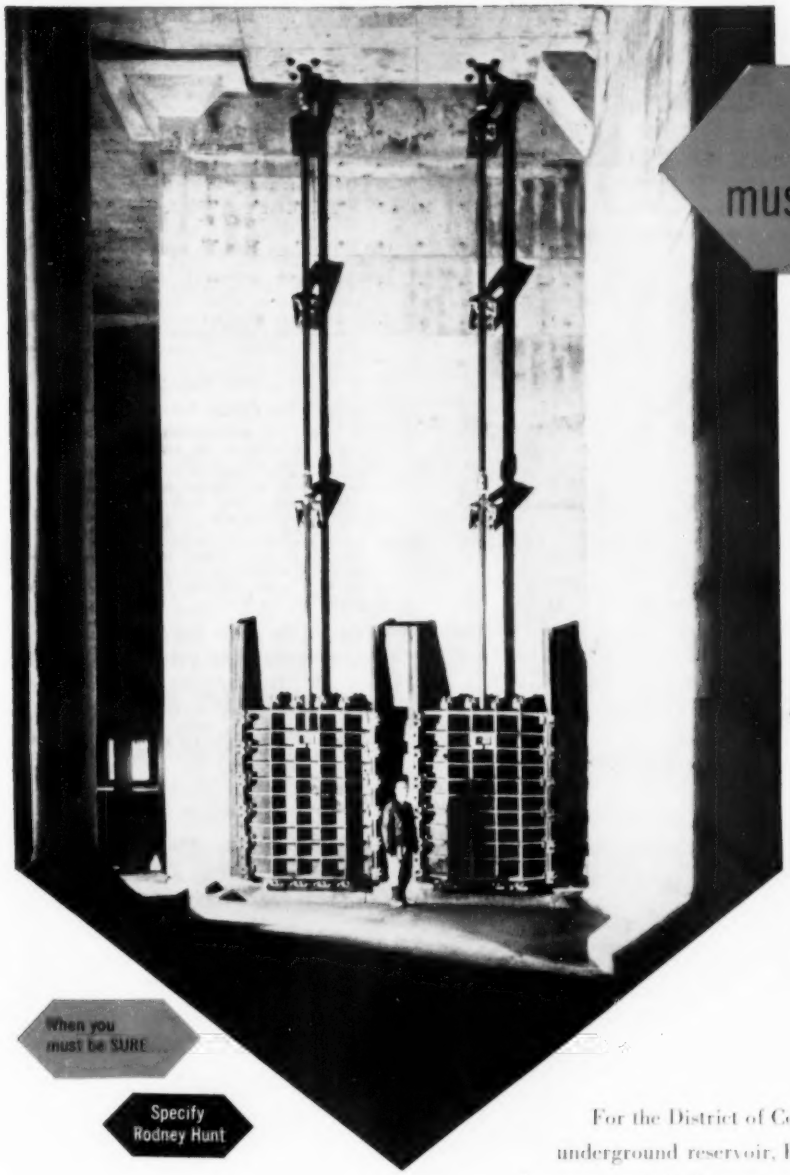
Data Offered on Root-Proof Pipe and Fittings

352. Orangeburg sewer pipe and fittings with root-proof Taperweld joints are described in a comprehensive bulletin offered by Orangeburg Mfg. Co., Orangeburg, N. Y. Detailed information is included on layouts and installation for sewerage and drainage. Get 12-page Catalog No. 306 by checking the coupon.

CONSTRUCTION EQUIPMENT AND MATERIALS

Safety Lantern With Pencil Beam Signal

70. Get information on the Dietz "Night Watch" Safety Lantern with special globe design that saves fuel by intensifying light rays into a pencil beam. Full details available from R. E. Dietz Co., Syracuse, N. Y. Just check the coupon for full data.



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Two of the eleven Rodney Hunt gates are shown; the others are as large as 8′ x 8′ clear-opening. All have heavy-duty wedges on all sides, double-bolted top and bottom, to withstand more than 50 feet of unseating pressure.

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What's Your Digging Problem? Repair Work? Trenches? Footings?

35. At today's prices, hand digging means the job will be costly. You can dig through asphalt and macadam, work fast and efficiently even in cramped areas with the tractor mounted Sherman Power Digger. From one position you can reach to dig 14 feet behind tractor in 140° arc and dig to a depth of 10 feet. For full details check the coupon. Sherman Products, Inc., Royal Oak, Mich.

1,001 Profitable Uses For Holmes-Owen Loader

39. The addition of a Holmes-Owen Loader to your dump truck converts it into a complete digging and loading unit that enables one man to load, haul and dump. Illustrated folder shows how this self-loading unit with hydraulic crowding action can be a real time and labor saver for the municipality or contractor. Check the handy coupon for full data. Ernest Holmes Co., Chattanooga, Tenn.

Attachments Keep Snow-Thrower On Job the Year 'Round

46. A variety of attachments designed to fit the rugged tractor unit of the Maxim Snow Thrower make it an all-year worker ready for mowing, cutting, dozing, towing and rolling. Full details on these economical snow throwers and their useful attachments are covered in bulletins offered by Maxim Silencer Co., 85 Homestead Ave., Hartford, Conn. Check the coupon for this data.

Lightweight Generator Gets Power Where You Need It

56. The Winco light-weight carryable generators with "Super-Charged" power provide economical answers to your power requirements on-the-job and are ready for dependable operation during emergencies. Literature on all models and useful accessories is available from Wincharger Corp., Sioux City, Iowa. Check the coupon today.

Inexpensive Ditcher Handles Heavy Digging

91. The Shawnee Scout Ditcher, a new, heavier model for extensive digging has been added to the Shawnee line of ditchers and dozers. All models are designed to handle ditching and backfilling operations quickly, efficiently and at low cost. Full information on this equipment will be sent by Shawnee Mfg. Co., 1947 N. Topeka, Topeka, Kansas. Just check the coupon.

Be Sure to Check Your Tractor Shovel Needs

94. A comprehensive 16-page catalog now available from Frank G. Hough Co., 761 Seventh St., Libertyville, Ill., shows how cities, counties, contractors and others use the Model HR four-wheel drive Payloader on earth and material handling jobs. Be sure to check the ways you could use this machine. Get Form No. 225 by checking the coupon.

Examining a Tractor Piece by Piece

99. The 32-page catalog published by International Harvester Company should be studied by every tractor owner, for in it each unit from engine to track of the TD-9 Diesel is considered separately. These piece by piece discussions are supplemented by notes on easy servicing, versatile applications and attachments for every need. Get your copy of form CR-313-A from International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or check the handy coupon.

Booklet Helps Design of Custom-Engineered Steel Buildings

110. Custom-engineered Butler steel buildings are available in every size, type and design to meet your building needs. In a helpful 32-page booklet you will find details on several basic designs and an unlimited variety of door, window and interior treatments; answers to your questions on construction and erection; and many illustrations of typical uses. Use the coupon or write to Butler Mfg. Co., Kansas City, Mo.

What You Should Know About Air-Placed Concrete

67. For a detailed explanation of the principle of "gunned" or "air placed" concrete and description of the improved Model 750 and 1250 Bondactors, be sure to get your copy of Form 553 from Air Placement Equipment Co., 1011 W. 24th St., Kansas City 8, Mo. Check the coupon today.

New Economy in Brush Clearing Work

78. Quick, effective brush cutting with the Brushmaster saw lets one man do the work of six when clearing brush for highway departments, on watersheds, along right-of-ways. Brambles, briers, vines, bushes, brush and saplings up to 4" dia. are easily cut with this lightweight, powerful tool. For full data check the coupon. Brushmaster Saw, Inc., 89 Emerald St., Keene, N. H.

8 Reasons Why You Should Check the Jaeger Loader

207. In a profusely illustrated 16-page catalog devoted to the applications and special design features of the Jaeger "Load-Plus" tractor-loader unit, eight good reasons listed to back up the claim that this machine outproduces any other loader of its size. These include load capacity, balance, reach, maneuverability, automatic power adjustment by torque converter, instant reversal, multiple speed and ease of control. Check them all by getting a copy of Catalog L100-3. Check the coupon today. Jaeger Machine Co., 400 Dublin Ave., Columbus 15, Ohio.

Details on Motor Grader Construction and Use

312. In a handsome catalog, profusely illustrated with diagrams and photographs of unusually fine quality, the Galion Iron Works and Mfg. Co., Galion, Ohio, has presented all details on the construction and operating features of their Model 118 motor grader. This impressive 28-page catalog, No. 375, is available without charge. Just check the coupon.

Photo Courtesy of International Harvester Company

McMahon roadside sprayer service

with "know-how" as well as Weed-Killer

We will do your roadside spraying on contract basis faster and cheaper than you can do it yourself. No winter-idle equipment on your hands and cost sheets. Ends your weeds, worries, and costs in securing labor and equipment.

Are you interested in engineering service that figures your needs against your budget? In purchasing equipment? In franchising sprayers? If so consult us without obligation.

McMAHON BROS. 93 Main St., Binghamton, N. Y.

How a city of 19,000 people solved its sanitation problem

TIFFIN, OHIO — Faced with rising costs and mounting taxpayer dissatisfaction with open truck collection, the City Council of this progressive mid-western city wisely decided to organize a *new municipally-owned system of refuse collection and disposal.* Following a careful analysis of the problem, and numerous equipment tests, *two 16-yd. GAR WOOD LOAD-PACKERS** were put into operation in January 1953, with the comparative results shown in the chart below.

Sanitation Superintendent Francis C. Staib reports:

"Our new collection and disposal system fulfills a long standing need of the citizens of Tiffin. Thorough planning has achieved standards of municipal sanitation *which currently serve as a model for many small cities* . . . and with costs so moderate and service so efficient that complaints from taxpayers are past history. Our ten-year financing program has *placed no strain on the city's financial stability* . . . and the unprecedented economy of operation of our modern equipment gives every indication that our citizens *will continue to enjoy lowest possible service rates.*"

Your city too, can benefit from the advantages of a modern Gar Wood Load-Packer* refuse collection system. Ask your local Gar Wood distributor for a free Load-Packer* demonstration, or write today for complete descriptive literature. No obligation, of course.

*Load-Packer is the registered trademark of Gar Wood Industries, Inc.

Smart-looking 16-yd. Gar Wood Load-Packer* collects up to three times its rated capacity of *mixed* garbage and refuse in one trip. Low, wide hopper speeds loading, reduces strain, eliminates spillage.

Point-by-point COMPARISON	PREVIOUS SYSTEM	LOAD-PACKER* SYSTEM
1 Material Collected	*Organic garbage only.* Citizens and business establishments had to make own arrangements for trash disposal. Tin cans and bottles collected twice yearly.	*All garbage and refuse* collected on each trip. No special collections required for trash, cans, bottles, and other trash.
2 Service	Streets and alleys frequently *littered with garbage* and blowing papers from open trucks. Constant complaints.	Fully enclosed, leak and odor-proof Load-Packers improved sanitation, *eliminated complaints.*
3 Schedules	*Irregular and undependable.* Residential and commercial refuse frequently piled up awaiting pick-up.	*Regular weekly collections,* plus more frequent collections at business establishments and other places where needed.
4 Method of Disposal	*Open pit . . .* caused constant complaints, due to unsanitary and unsightly conditions at dump.	*Sanitary land fill* in natural gulley close to town. Refuse covered daily to eliminate odors, vermin, etc.
5 Costs	Paid from city funds. Latest low bid $20,000 per year with no improvement in service.	All costs for collection and disposal operation plus 10-year depreciation of capital investment *paid from moderate collection fees.* (Residential, all refuse — $3.00 quarterly.)

GW-LP-2

GAR WOOD INDUSTRIES, INC.
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WORLD'S LARGEST MANUFACTURER OF DUMP BODIES AND HOISTS FOR TRUCKS AND TRAILERS

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Get This Helpful Sign Manual

367. Detailed information on all classifications of National Standard Signs for control of traffic, street identification and other purposes, together with a complete line of accessories is presented in a convenient Sign Manual by Lyle Signs, Inc., 2720 University Ave., S.E., Minneapolis 14, Minn. For a copy, check the coupon.

How Reflective Sheeting Improves Traffic Signs

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CIVIL DEFENSE

Get the Facts on Air Raid Sirens

86. There's more to be considered in air raid warning sirens than the loudness of the signal. Get complete information on efficient size and spacing of sirens from Federal Sign and Signal Corp., 8733 So. State St., Chicago, Ill., by using coupon.

Electric Power Wherever You Need It

75. Electric power for every job—for construction, maintenance and emergencies—is always available for the owner of a convenient Homelite carryable generator. These compact, gasoline engine operated units are made in a variety of sizes to suit every power requirement. Get full details by writing Homelite Corp., Port Chester, N. Y., or check the coupon.

WEED CONTROL

Weed Killing Case Histories

26. Low cost weed and grass control with Du Pont "Telvar" W weed killer is demonstrated by full-color photographs in a new booklet issued by Grasselli Chemicals Dept., E. I. Du Pont de Nemours & Co., Inc., Wilmington 98, Del. Text includes application methods for best results. Check the coupon for your copy.

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CUTS MORE FEET PER DAY!

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LOWER COST-PER-CUT!

MAKES MORE FOOTAGE PER DAY. Model 252 is SELF-PROPELLED! Cuts faster, requires no tiresome pushing on long straight-a-way-cuts! Eliminates frequent rest periods and loss of footage!

DIAMOND BLADES LAST LONGER—Smooth, uniform travel eliminates sudden bumps, jolts, side deflections and similar causes of diamond wheel damage. Field reports show up to *DOUBLE* the life from your diamond wheels!

HUSKY, SELF-STARTING 13.5 HORSEPOWER ENGINE—Standard equipment. Also available with 26 h.p. engine (illustrated) for deep cutting with large wheel sizes. CUTS 7 INCHES DEEP with 18" blade! Uses any blade diameter between 10" and 18".

RIGHT OR LEFT HAND OPERATION—Spindle uses diamond wheel on either end.

HYDRAULIC LOWERING AND RAISING MECHANISM eases blade into and out of cut, minimizes blade shock.

WORKS CLOSE TO WALLS, CURBS, ETC. Special hinged blade guard lifts up, exposes wheel for close-up jobs.

Other concrete cutter models available. Ask for literature or see your local DI-MET dealer!

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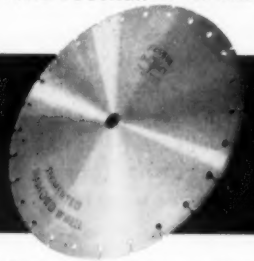
the DIAMOND BLADE with MORE FOOTAGE in its rim!



Built in a wide range of bond variations to deliver peak performance on your individual job! The right bond means longer life, lower cost-per-cut! Specify DI-MET Segmented Type.

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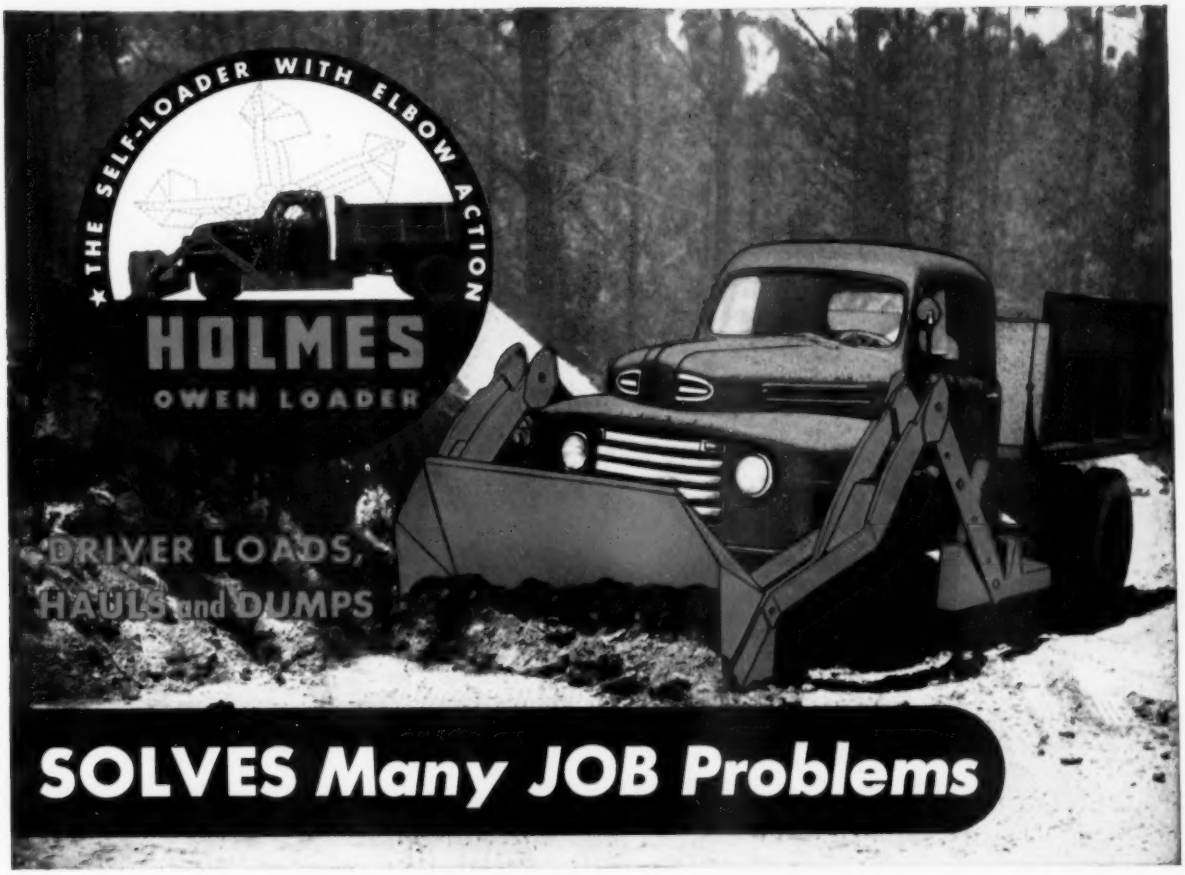
WORLD'S LARGEST AND OLDEST MANUFACTURER OF DIAMOND ABRASIVE CUT-OFF WHEELS AND MACHINES



VERSATILE ONE-MAN OPERATION SAVES Time - Manpower - Equipment

The new Holmes-Owen Loader offers a very practical solution to many of the problems which state, county and city officials are now facing in providing increased community services.

The new self-loader provides the answer to such problems, for this equipment converts the usual dump truck into an independent working unit capable of performing a wide variety of work. It saves time, labor and the use of more costly equipment by permitting the truck driver to do his own light digging, grading, loading, and cleaning-up.

A dump truck with such versatile one-man operation can easily do the work of several men, thereby drastically cutting the cost of many jobs, such as: the handling of various stock pile materials, removal of debris, trash, snow, etc., cleaning-up of streets, intersections, parkways, etc. Let us show you how a Holmes-Owen Loader will solve your work problem. Ask your equipment dealer for details or write factory direct.

Manufactured by

Developers of HOLMES WRECKER Equipment

DRIVER controls digging and loading operation from cab.

One-man operation speeds up LOADING, HAULING and UNLOADING.

ERNEST HOLMES COMPANY, Chattanooga, Tenn.

Now's the time to mail this month's Readers' Service card.

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Sherman Power Diggers Make Small Jobs Profitable

Get all the advantages of power digging, even on smaller jobs where you can't afford to use heavy equipment.

Mounted on a rubber-tired tractor, the Sherman Power Digger makes a compact outfit that gets in and out of tight spots quickly and easily, moves from job to job at top tractor speeds.

It gets digging done in a fraction of the time and cost of manual labor. It digs as deep as 10′ below grade in mud, hardpan, gravel, shale or stony ground. Wide arc of swing allows ample reach for piling or loading. Instant fingertip control harnesses forces up to 10,000 pounds at shovel teeth.

The Sherman Power Digger is low in initial cost, economical to operate and maintain . . . often pays for itself on the first job. Write today for free descriptive bulletin No. N-51R.

Heavy, sticky "gumbo" mud presents no problem for the Sherman Digger.

The Sherman Power Digger operates in spots where bigger machines can't.

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Other patents pending

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What You Should Know About Chemical Weed Control

132. In a convenient 44-page book, the C. B. Dolge Co. gives full details on spraying procedures and chemicals to use for control of lawn and roadside weeds, ragweed eradication and insect control in turf. Get your copy by checking the coupon or write C. B. Dolge Co., Westport, Conn.

REFUSE COLLECTION AND DISPOSAL

Sanitary Landfill Operation and Methods

28. The location and area requirements for sanitary landfill, operation methods for trench type and area fills, equipment selection and costs are items discussed in an 8-page booklet issued by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Be sure you have this reference when considering the problem of garbage and refuse disposal. Check the handy coupon today.

How to Reduce Refuse Collection Costs

123. The sequence of operations for fast loading and refuse compaction in the Gar Wood Load-Packer are illustrated and described in 12-page folder W-110, together with size data and details of hydraulic elements. Be sure to check all details of the efficient Load-Packer system. Check coupon or write Gar Wood Industries, Wayne Division, Wayne, Mich.

Increasing the Efficiency of Bulk Rubbish Collection

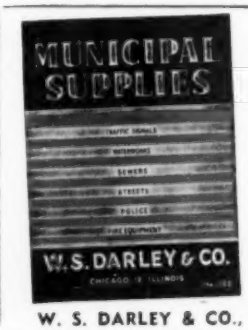
177. Strategically spotted bulk containers can be handled by one man operating a Dempster-Dumpster equipped truck. Get full details of this cost-saving system of rubbish collection, as used by many cities to increase efficiency and eliminate unsanitary conditions. Write Dempster Brothers, Inc., 952 Dempster Bldg., Knoxville 17, Tenn., or use the handy coupon.

Thinking of Sanitary Fill? Get This Booklet Now

285. Good management of sanitary landfills requires rugged, dependable equipment to excavate dirt, compact refuse and handle cover material. Such equipment, in use on landfill projects coast to coast, is featured in a new 8-page booklet titled "Community Workers," issued by the Caterpillar Tractor Co., Peoria 8, Ill. Check the coupon for a copy.

What You Should Know About Refuse Incinerators

362. Two helpful bulletins tell what you should know about low cost refuse incineration for the small community and for larger cities. Your questions on mechanical stoking, burning rates and operating problems are discussed. Get Bulletins 217 and 223 from Nichols Engineering & Research Corp., 70 Pine St., New York 5, N. Y. Just check the coupon.



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Bitumuls is available in grades for all types of maintenance work. Fast Setting for Sealing, Surface Treatment and for Penetration work; Mixing Grades for fast, uniform coating of a wide range of aggregates, from sand to clay-gravel.

There are Bitumuls Engineers who work out of offices near you. Call on them whenever you feel that they can assist on maintenance problems.

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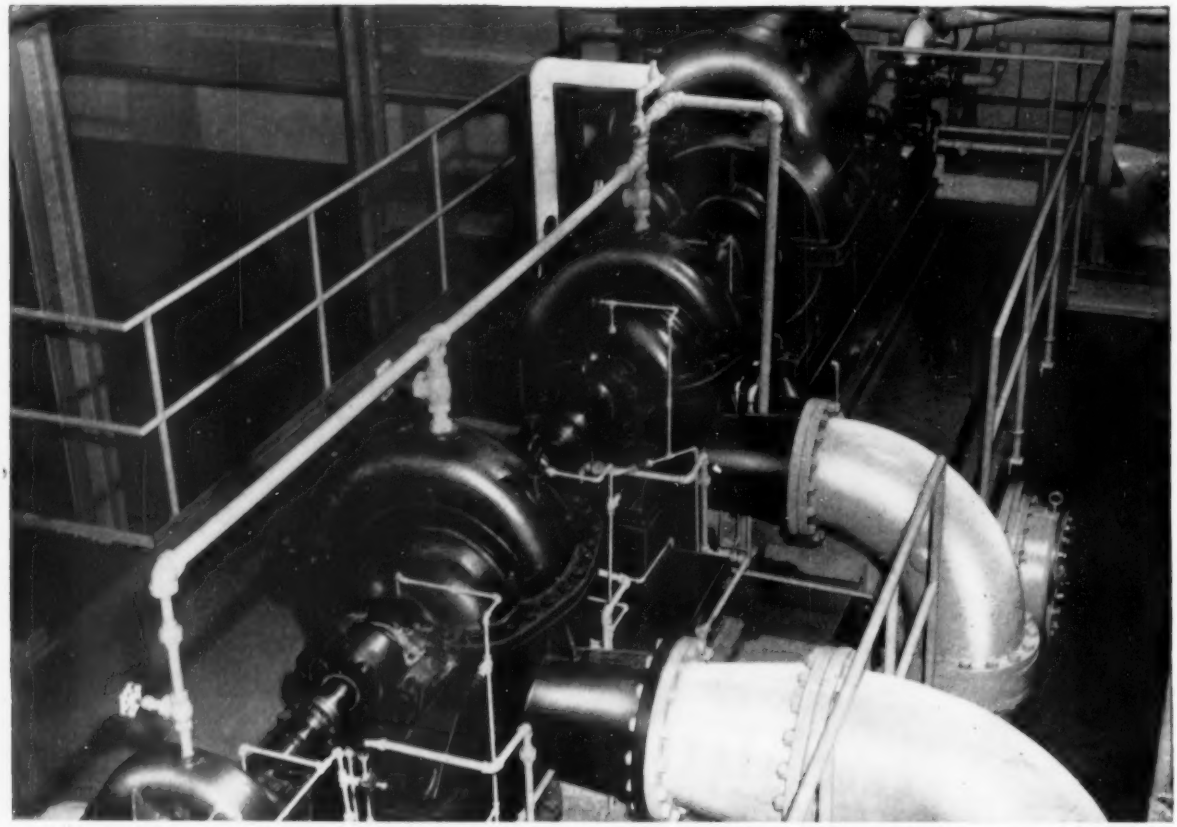

15 MILLION GALLONS per day are delivered by Worthington series-connected pumps at Wilmington's Holly Pumping Station. Two units, not shown, each deliver 12 million gallons per day. The additions to Wilmington's water system were engineered by Metcalf and Eddy, consulting engineers, in conjunction with the Wilmington Board of Water Commissioners.

Worthington pumps boost Wilmington's water facilities

Five new pumping units at Wilmington's Holly and Cool Spring Pumping Stations answer this growing Delaware city's demand for more water.

Three steam turbine-driven centrifugal units are installed at the Holly Pumping Station. One delivers water from the Brandywine River to a reservoir and new filter plant. Two deliver filtered and purified water to the city main and the Cool Spring Reservoir.

Equipped with two Worthington motor-driven centrifugal pumps, the Cool Spring Station supplies the ever increasing demand in Wilmington's Rockford Park area.

Hundreds of municipalities have learned that high-volume output and low operating costs go with all the rugged, long-lived equipment that Worthington builds. And users get the benefits of unit responsibility because Worthington builds both pumps *and* drives.

That's why it's sound business to make Worthington your headquarters for all water works and sewage equipment — pumps, comminutors, Diesels, turbines.

For more of the story about the Worthington line, write today for Bulletin W-312B9C. Worthington Corporation, Public Works Division, Harrison, New Jersey. W.3.5

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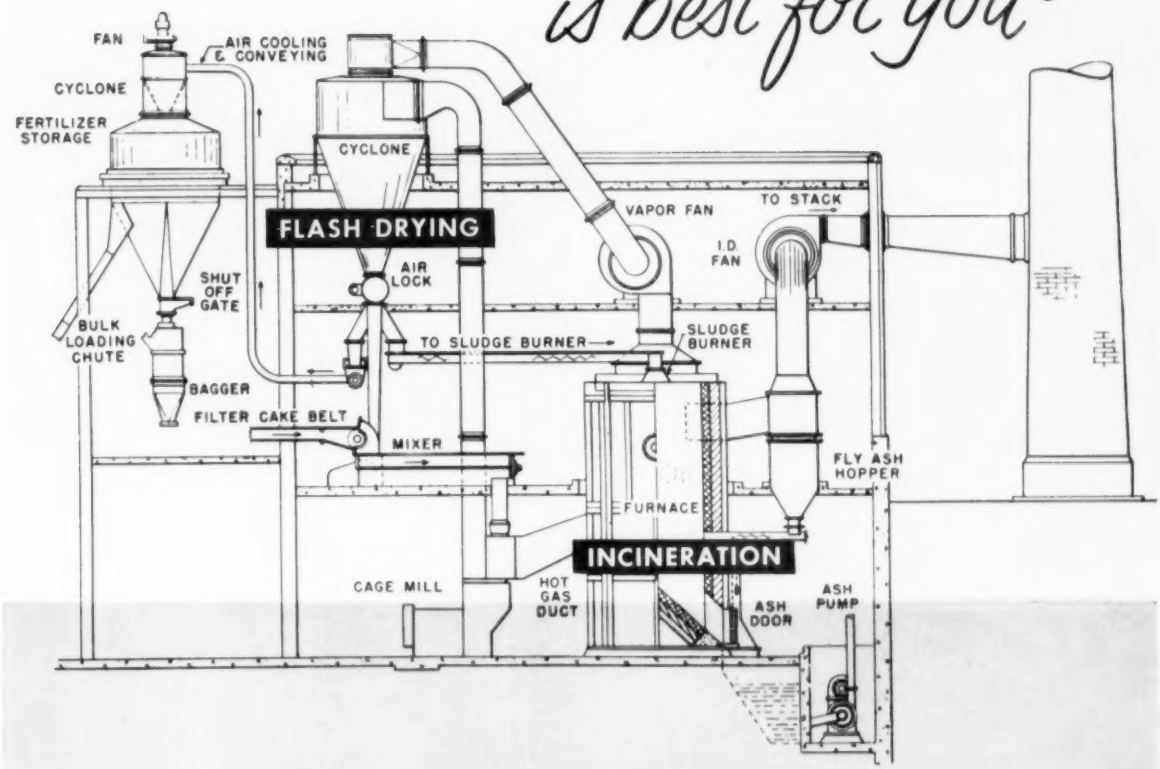

Only the C-E Raymond System of Flash Drying & Incineration offers the proved, practical flexibility which permits *either* flash drying sewage sludge to a marketable fertilizer . . . or incinerating it to a sterile ash—in any proportion and under complete control. In either case, too, high temperature deodorization of stack gases may be included if you wish.

This flexibility of the C-E Raymond System is an important reason why it is the most widely used heat method of sewage sludge disposal. In fact, the total daily capacity of C-E Raymond Systems installed, under construction or on order is *nearly 50% more than all other heat methods combined.*

Furthermore, the C-E Raymond System has been proved in service in communities of every size—ranging in equivalent population from 6,000 to 3,600,000—and located in every section of the country, coast to coast.

So, whatever your particular requirements, look to the leader for help in selecting the proper equipment. The services of a qualified engineer are freely available to you or your consultants. B-755

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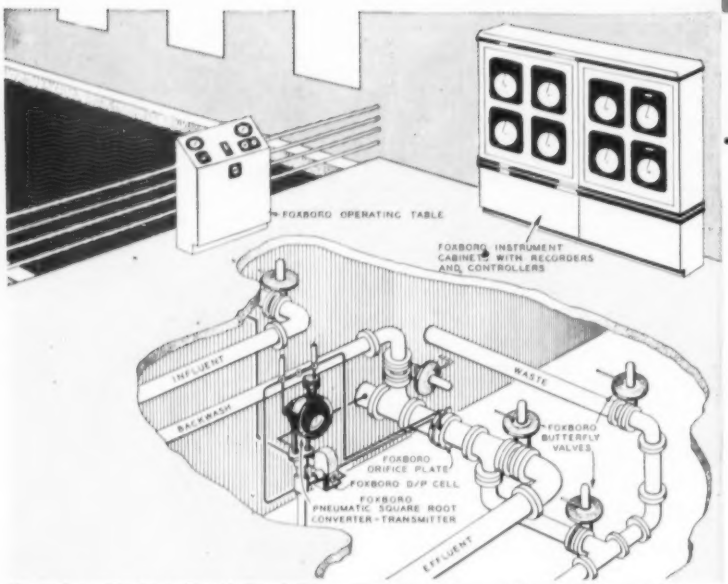

A modern Foxboro Rapid Sand Filter Control System. When Selector Switch on operating table is turned to desired position Foxboro Controllers automatically take over operational control of valves.

...a "foolproof" system that is easier to install, to operate, and to maintain

The New Foxboro Rapid Sand Filter Control System combines maximum operating convenience with a minimum of maintenance. Its all-pneumatic transmission and control eliminates drums, cables, and pulleys . . . makes possible remote operation of valves without high pressure piping to the control panel.

In normal operation, the operator needs only to turn the selector switch to one of its four positions to control: filtering; influent-off; backwashing; effluent-to-waste. Also, all adjustments of filtering and backwashing rates are easily made at the operating table.

All connections are made with ¼" copper tubing. Hence, installations with remote setting of flow rates . . . and with supplementary remote indication . . . are simple and economical.

Write for detailed Bulletin 466. **The Foxboro Company, 267 Norfolk St., Foxboro, Mass., U.S.A.** Branch offices in principal cities.

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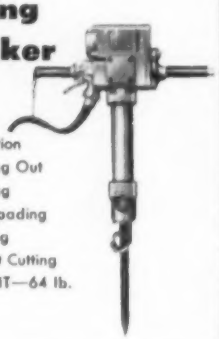

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These ruggedly built tools are real cost cutters on any job. They combine low initial cost with low operating cost for unexcelled economy.

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HIGH CYCLE electric motors, powered by Homelite's dual purpose generator, will give you greater flexibility and thousands of hours of heavy-duty service. Ask for an on-the-job demonstration or for more information. Write Homelite Corporation, Port Chester, New York.

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Combination Gear and Motor Drive

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The best way to get at that extra supply of water under your feet is with one of these powerful Worthington vertical turbine pumps. These modern pumps will pull up all the water you need—at an operating cost that's easy on your budget.

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As a vertical turbine pump specialist, your Worthington distributor can provide you with engineering service including data on underground water sources, exploratory drilling and water surveys. He's had long experience in handling drilling, installation and service. He'll also be glad to send you a booklet on vertical turbine pumps for municipal water supply. Write for his name and address to Worthington Corporation, Vertical Turbine Division, Succasunna, New Jersey, or Denver, Colorado.

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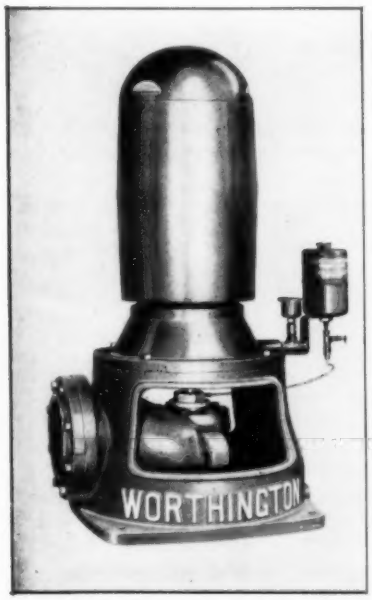
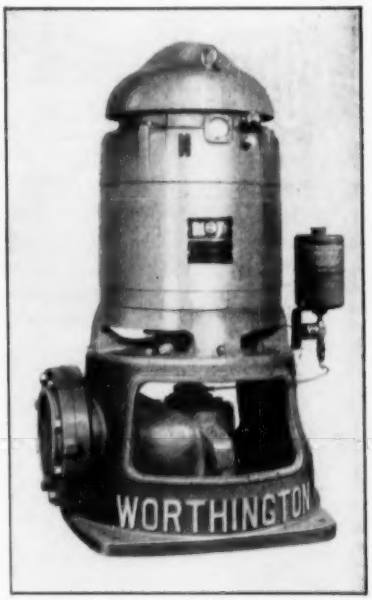


Surface Discharge Head-Belt Drive

Surface Discharge Head-Right Angle Gear Drive



Surface Discharge Head-Motor Drive

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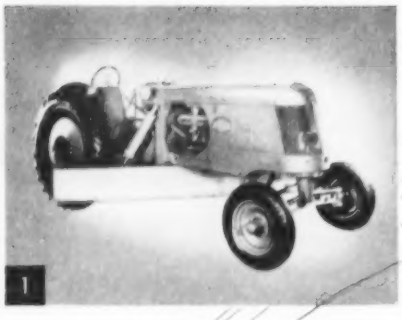

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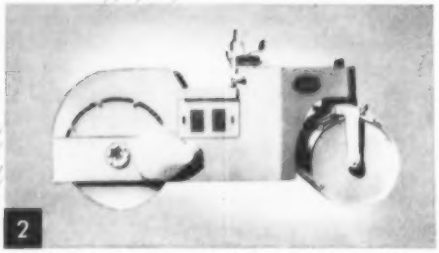

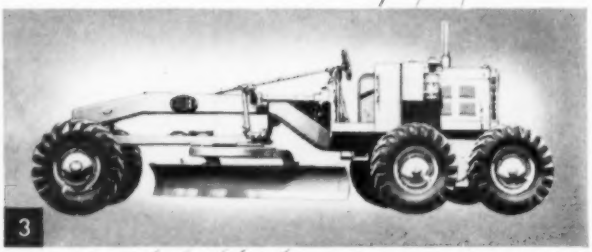

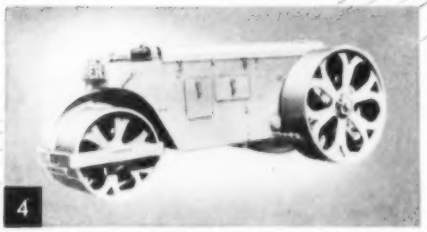

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This section of CLAY PIPE has just taken the 500-YEAR TORTURE TEST!

SCIENTISTS at the N.C.P.M.I. research laboratories in California have been trying for years to find some worn-out Clay Pipe. They wanted just one worn-out length, so they could study it and determine how to make it better.

They looked everywhere. They dug up Clay Pipe that had been in service for 50, 100, and 150 years — but it was still in first-class condition. They wrote letters to all parts of the country, without success. Finally they decided to wear out a brand-new section in the lab.

Clay Pipe in service is often subjected to alkaline ground waters — so they boiled it in a concentrated solution of corrosive alkali. Then they soaked the same length in sulphuric acid for a week, to duplicate the corrosive effects of sewage gases. For good measure, they ran a stream of hydrochloric acid through it for another week. Then they half filled it with gravel, plugged up the ends, and put it in a machine that shook it like a cocktail, to see what effect years of abrasion might have on the inner walls. They soaked it in successive solutions of hot detergent, sea water, and the 16 most common industrial wastes.

After the test — roughly equal to 500 years of sewerage torture — they checked its dimensions, absorption, and crushing strength. *It was still as strong and round, as hard and smooth, as the day it was made.*

In the lab or in the ground, Clay Pipe is the *only* pipe that never wears out. Insist on it when you want permanent sewerage protection.

Vitrified CLAY PIPE

CLAY PIPE NEVER WEARS OUT!

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More and more, this big 4-wheel drive loader of 1½ cubic yard bucket capacity is proving that it will work where other rubber-tired loaders fail, and that it's powerful enough to do jobs formerly requiring crawler-type equipment.

Now, you can load a 6-yard truck in one minute. Shoveloader's TRIPLE-ACTION bucket breaks-back down low... crowds forward and hoists all in one motion. Your actual pick-up is up to 2 cubic yards of material.

The high rear axle oscillation assures positive four wheel traction while low center of gravity means good stability.

SHOVELOADER'S other features include—long forward reach, high lift, full-width bucket, bucket arms forward—safely away from operator, power steering on two or four wheels, full visibility.

Prove it to yourself with a demonstration. Call your nearest Baker-Lull dealer. Or write us for demonstration reports and Bulletin Ad-55A. The Baker-Lull Corporation, 380 West 90th Street, Minneapolis 20, Minn.

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SHOVELOADER®
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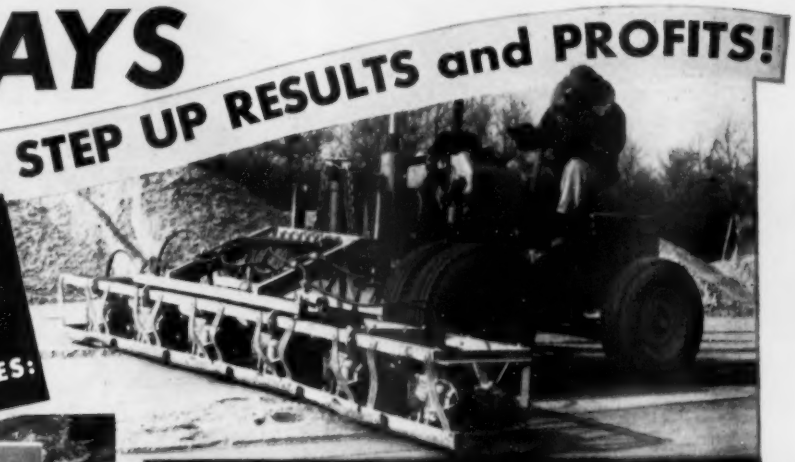
4 WAYS TO STEP UP RESULTS and PROFITS!



COMPACTION of GRANULAR SOILS FILLS, BASE COURSES:

THE JACKSON VIBRATORY MULTIPLE COMPACTOR,

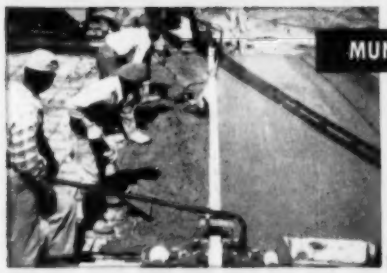
with a total compaction width of 13' 3", working speeds of 0' to 60' per minute and reverse travel speed of 5½ MPH, in two passes will compact granular soils in 10" to 12" layers to standard PROCTOR density. It's far more maneuverable than larger, more expensive equipment, gets into places the latter cannot reach. And for the really tight spots, the individual vibratory units may be detached, equipped with operating handles and operated as self-propelling, manually-guided compactors as shown below. Power plant provides contractor with highly mobile, 7.5 KVA, 110-120 Cy., single and 3-phase power supply. This machine is also widely used for compacting rock base courses and fines in macadam construction.

SOIL COMPACTION IN TRENCHES — CONCRETE FLOOR SUB-BASES,

pipeline fills and similar jobs are done with unequalled speed and thoroughness with the JACKSON manually-guided, self-propelling Vibratory Compactor. It throws up to 4500 1¾-ton blows per minute and will compact granular soils in 8" to 10" depths to specified density at the rate of 1800 to 2400 sq. ft. per hour. Interchangeable bases of 12" to 26" are available.

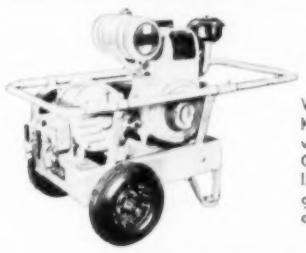
BLACKTOP WIDENING & PATCHING

The same machine described above, operated from power plant on auto-trailer with pickup for Compactor, is an extremely efficient means of blacktop pavement widening and patching, paving drives, walks, etc. Compacts up to 2400 sq. ft. per hour close to maximum density of material used.



MUNICIPAL PAVING — HIGHWAY WIDENING and PATCHING

The JACKSON Vibratory Screed strikes off to all crowns, undercuts at curb or side-form, works right up to and around obstructions and is quickly and easily rolled back for second passes. Suitable to all slabs up to 30' wide. Most productive and convenient screed made. Operated from Jackson Portable Power Plant.



DUAL CURRENT PORTABLE POWER

for operating all JACKSON Vibrators, power tools and lights. Models from 2.5 to 7.5 KVA, providing both single and 3-phase 60 Cy., 120 V, AC (120/240 V in larger models). Permanent magnet generators require no adjustment or maintenance.

JACKSON VIBRATORS, INC.

Ludington, Michigan

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or write, wire or phone us for complete information concerning any or all of the equipment shown.

Stop Dry Weather "Wear Off" of Materials with STERLING ROCK SALT

Keep Summer Roads Hard, Dense, Tight and Stable!

Proper stabilization with STERLING ROCK SALT and clay gives road wearing surfaces the flexibility to adapt themselves to the weather—hot or cold, wet or dry. For rock salt is Nature's own soil stabilizer.

In hot, dry weather, STERLING ROCK SALT rises, crystallizes—and firmly "anchors" the clays and fines at the wearing surface. That's why, even after prolonged dry spells, a Sterling stabilized road will show a tough, firm surface.

So don't let a lot of your work and the taxpayer's money go up in dust this summer. Prevent the loss of surface materials—and the extra repair and maintenance that follows in the wake of summer dust clouds on unstabilized roads.

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☐ Please send Road Stabilization literature.
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Plan now to stabilize with STERLING ROCK SALT. For information on up-to-the-minute methods—old roadbeds or new construction—fill out and mail the coupon at left.

INTERNATIONAL SALT CO., INC.
INDUSTRIAL DIVISION
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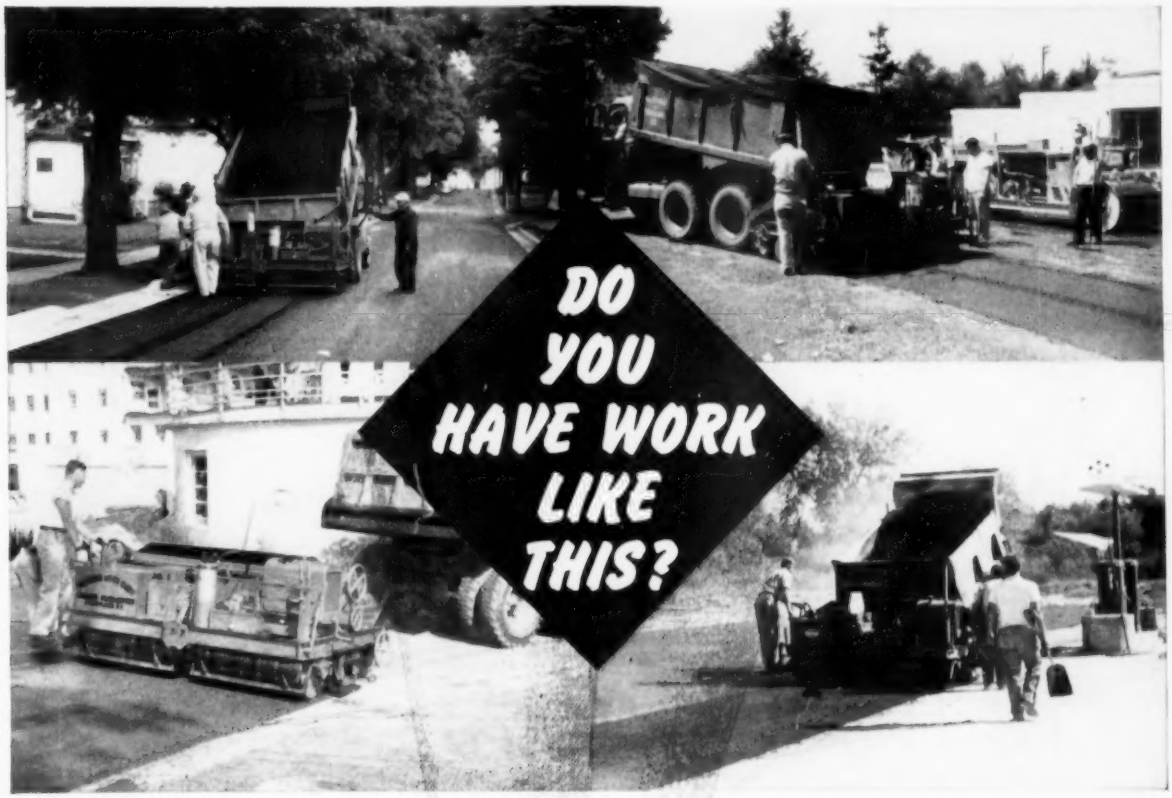
STERLING ROCK SALT
"Nature's Own Soil Stabilizer"

Thousands use our Readers' Service card to keep up to date . . . do you?



VILLAGE AND CITY street work, parking lots, driveways, service stations, tennis courts, non-specification asphalt pavements of all kinds!—That's the place for your Adnun Jr., Model 8 Black Top Paver.

The Adnun Jr. is built to give you long life, trouble-free service in miles of work. It will spread any dry or bituminous material. Every bearing is anti-friction, transmission gears have cut teeth and run in oil. All design follows the pattern and quality of larger machines built for state road work.

The Adnun Jr. is self-maneuvering without load. Power Raker Bar and Oscillating Cutter Bar are standard equipment. Overlapping action of Cutter Bar compacts joint and reduces raking. Dual control facilitates handling. Smoothness of course is assured by Continuous Course Correction feature.

The Adnun Jr. makes those non-specification jobs more profitable. It saves time and labor for you and gives you a sales point with the customer because you deliver his job faster. Ask our sales agent for complete details.

ADNUN JR
MODEL 8
BLACK TOP PAVER

BLAW-KNOX COMPANY
FOOTE CONSTRUCTION EQUIPMENT DIVISION
1954 State Street
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BLAW-KNOX

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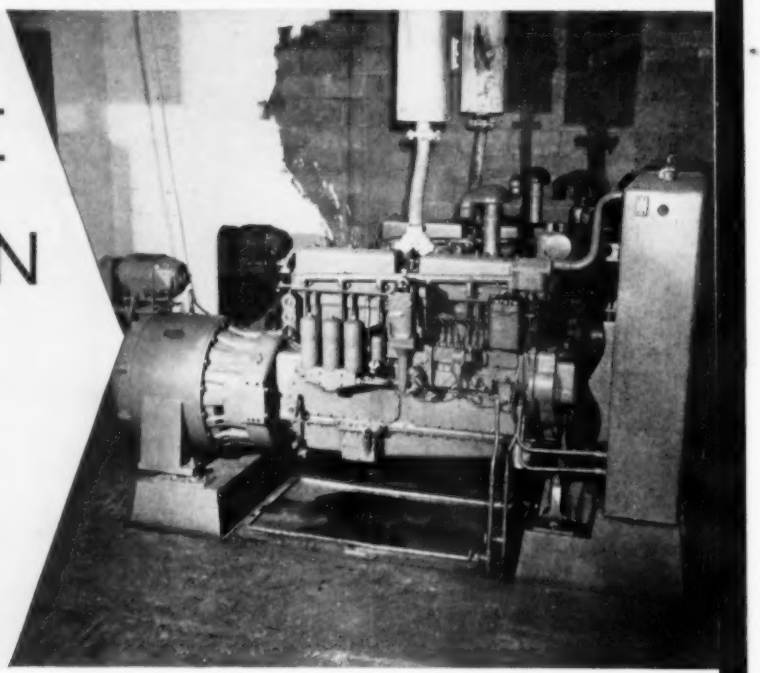
HERE'S WHERE A WHOLE TOWN GETS ITS **POWER**



Offhand, there are two interesting things about the neat little city of Kanopolis, Kansas. It's almost dead-center in the U. S. And it's powered *entirely* by the two CAT* D13000 Diesel Electric Sets you see here.

The citizens of Kanopolis used to depend on another source of power, but it failed them whenever the wind was mean enough to kick dust around—which is often in this dry belt. Harvey E. Merrill and Paul F. Arensman, engineers in charge of the light plant, say, "We figured Cats were the best and most reliable engines we could get." So the city switched. Even Kansas dust can't run the gauntlet of this D13000's multi-step air cleaner.

Dependable 24-hour power is assured by other unique Caterpillar features, too. The crankshaft, for instance, is forged of specially selected steel, its bearing surfaces "Hi-Electro" hardened and finished to mirror-like smoothness. And superior construction like this has paid off for Kanopolis. The two electric sets have operated more than 26,000 hours each, with the down time being limited to one overhaul on each unit.

Another point helped sell the city officials. "We can get parts from only 30 miles away, any time. Even Sundays."

And during Kanopolis' night football season, when the power load jumps over 40%, there's hardly a light flicker in town as these big yellow diesels promptly pick up the extra burden.

Important, too, for economy-minded officials: the Caterpillar fuel system takes low-cost No. 2 furnace oil with no danger of fouling.

Your Caterpillar Dealer has self-regulating diesel electric sets from 20 to 117 KW, externally regulated sizes from 20 to 315 KW. He'll be glad to help you any way he can.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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WE'VE MADE CLAIMS... NOW MAKE US PROVE THEM

PUBLIC WORKS
JULY

AUTOMATIC pH CONTROL REPLACES MANUAL OPERATION FOR ACID WASTE TREATMENT

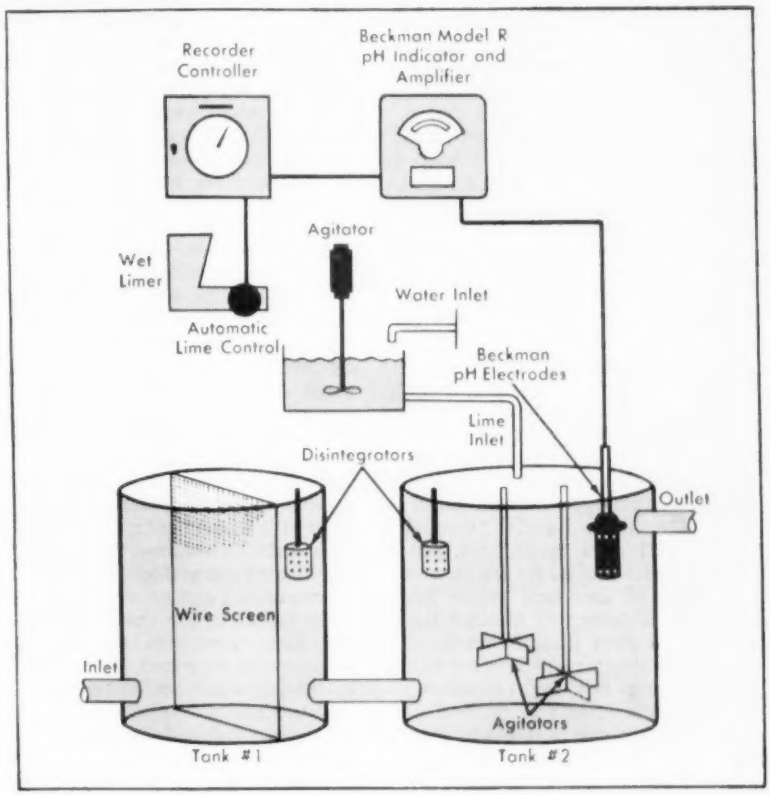
PETER L. SHUGART

DUE to the diversification of its processes, Exchange Lemon Products Co., Covina, California has a variety of industrial wastes including the following: 1. Wash water from lemon and orange juicing operations. 2. Brine and sodium bisulfite from fermentation tanks in which citrus peels are processed. 3. Caustic wash water from bottling plant. 4. Wash water from fly ash remover used with dryer in making citrus peel cattle feed. 5. Pulp from orange and lemon juice and oil extraction processes.

Disposal of these materials is made through a county sewer line. County officials require that the waste have a pH greater than 6.0. The pH range of the waste when oranges are processed is 4.0 to 4.5 and drops to 3.0 to 3.5 when lemons are processed.

The diagram herewith shows the equipment layout that was used to provide automatic pH Control with a Beckman pH indicator. The various wastes are fed into tank No. 1 which has a capacity of 2,500 gallons and is separated into two sections by a metal screen. The screen prevents an excessive load on a disintegrator which is located in one section of the tank. Pulp and other solid matter is pumped around the screen and into the disintegrator to shred it into small particles in preparation for further treatment.

The waste is then allowed to flow into tank No. 2 which has a capacity of 3,500 gallons. A disintegrator is placed at the inlet of this tank to further decrease the particle size of suspended materials. Two agitators are located near the center of the tank to provide adequate mixing and to keep solids from settling out. The outlet is located near the top of the tank and directly opposite the inlet. A Beckman Electrode Immersion Assembly with



● DIAGRAM shows equipment layout for treatment of orange and lemon wastes.

standard glass and reference electrodes and a resistance thermometer is mounted near the outlet. The pH electrodes are connected to a Beckman Model R pH indicator which, in turn is connected to a circular chart recorder with pneumatic controller. The controller is set to maintain the sewage effluent within a pH range of 6.0 to 8.0. This is done through regulation of the feed rate of lime from a Wallace and Tiernan feeder, which feeds at a rate controlled by the pH of the waste into a small tank. The lime is made into a suspension by means of a constant flow of water and an agitator. The suspension flows into tank No. 2 at a constant rate but with a concentration varying with the acidity of the incoming waste.

Prior to this installation a manually operated limer was used. It was replaced because it was not capable of maintaining the required pH control. Wide variability of acidity and of total waste volume made close control impossible. In some instances the sewage effluent was over-limed and at other times the acidity was not adequately neutralized.

The use of a recorder for this installation was found particularly useful since it provides a permanent record available for periodic inspection by county industrial waste disposal officials.

Expanded Facilities Used For

HENRY G. LUECKE

County Superintendent of Equipment,

Ramsey County, Minnesota

IN our county we have nearly 450 miles of county-maintained roads and streets to serve some 360,000 people. Some of these roads have grown up gradually through the steps of grading, graveling and finally surfacing. Some of them are of the narrow, concrete type placed in the early 1920's. Ours is a highly urban area and although we are faced each year with the job of creating some small mileage of new roads, our principal task, year after year, is the repair, maintenance and rehabilitation of our existing road net.

To accomplish this ever-increasing task, we have relied increasingly on modern methods and machines. Prior to 1940, our bituminous mixes for patching and maintenance had been rather haphazardly produced, using concrete-type mixers. Larger road jobs were handled through the use of bladed road-mixes, generally an MC-3 type. As we entered the years of increased traffic and industrial activity, we realized that we had to start thinking in terms of hot bituminous materials, not only for patching but for resurfacing. However, the money to purchase a commercial hot-mix asphalt plant wasn't to be had in 1940, so we bought, begged, borrowed and almost stole a yard full of miscellaneous ironware and put together a home-made hot mix plant. I remember the dryer consisted of a pipe section of 5-ft. diameter, riding first on tires of bent strap iron, later replaced with a pair of salvaged iron locomotive tires. Rube Goldberg type that it was, it taught us a lot about the use of hot mix and by 1945 we were able to consider the purchase of a real plant.

That's when we bought our first Barber-Greene plant, a Model 842. This consisted of a dryer, a belt conveyor, going from the dryer to the mixer and the mixer itself. This stepped our plant capacity up to 45 tons per hour and permitted proper proportioning of the aggregate sizes at the cold feed end. We used this plant in 1945 and during the 1946 season; and we continued to prepare patch mixes and do some resurfacing, using blades to spread the plant-mix. Although this wasn't the perfect solution, it did extend our paving season by making us considerably more independent of weather delays than we were in the road-mix days.

By 1947 we realized the need for mechanical spreading of our bituminous mixes and so we placed our order for a Barber-Greene finisher. We have used this machine for seven years now and have kept it in tip-top condition by an annual winter checkup.

Now we were in a position to switch over to the use of asphalt cements in our mixes; and we did so. Between 1947 and today, the story has been one of constant growth of our bituminous paving program.

● URBAN thoroughfare near St. Paul was paved by Ramsey County forces.

We produce only one kind of mix and we use it for our patching, resurfacing and new construction alike. Although we have varied the mix slightly from year to year, depending on the aggregates available, our 1953 specifications are typical. They are: sand 46.7 percent; crushed gravel (minus ¼-in.) 48.3 percent; and asphalt cement (85-100 pen.) 5.0 percent. We mix at 275° F. and try to have the temperature when laid not less than 250° F.

The extent of our operations is told in the tonnage figures for the past seven years. That we have operated our plant with real economy for our taxpayers is evidenced by the per ton cost figures opposite each year's production shown in Table 1. I would like to call attention to the fact that these prices are per ton, mixed and in the truck. They reflect not only the cost of material and labor, but amortization on the plant, fuel, gas, electric, water, etc., insurance, repairs and maintenance and even the salary for a year-round, 24-hour-a-day

● ASPHALTIC concrete being laid by two men with a finishing machine on a Ramsey County road.

Improving a County Road System

which handle the 250-mile county road system plus work on village streets.

watchman service and the costs of administration chargeable to the plant.

The 1953 figures are not available as this is written. To a degree this has been caused by the fact that between the 1952 and 1953 seasons we decided that the increasing use of bituminous paving in our county had reached a point where a larger asphalt plant was in order. Convinced of the accuracy and economy of a continuous mix type plant, and having received most satisfactory service from our Barber-Greene equipment, we decided to purchase a larger model of this company's product and did so, selecting their Model 848 plant, which gave us a potential of more than 150 tons per hour. We have stuck to the cold aggregate control plant setup and so did not order a gradation control unit. We set the dual gates of our aggregate feeder to the proper proportions, thus insuring the right percentages of sand and gravel. After drying, the whole bulk of aggregate is fed into the mixer and this proportioned feed is interlocked, mechanically, with the asphalt pump. This insures us a constant and accurate proportioning of both aggregate and asphalt, without actually employing screening and separation processes.

In keeping with our low-cost operation, our plant and lay-down crews have been kept to an efficient minimum. The plant is operated by four men, including the foreman. These same four men perform all of our off season plant maintenance and effect changes desired during the winter months. On the finisher we have an operator and a screed man, plus one other to direct trucks, act as flagman etc. The roller operators and truck drivers are, of course, in addition to these.

We employ about 9 trucks during the paving season; four being used to haul mix from the plant to the finisher and another four, sometimes five, bringing the aggregate which we buy from commercial sources to the plant. Although Ramsey County is second in population among Minnesota's counties, it is the smallest in area. Our plant is centrally located in the county and the haul to the finisher is never more than 15 miles.

Let's look at the picture of a typical year's operations. We start the plant up early in the year. In 1953 we began operations on March 9th. On March 10th we were plowing snow again, but as soon as the weather cleared, we began our patching operations.

Unless an unusually large area on one of the concrete roads has been broken by frost heaving, we do all of our patching with the same AC mix used for our paving. We clean up the broken-cut area, mop on a tack coat and put the hot patch material in. We always place an excess of mix on the spot and tamp it by hand. We have found that traffic, passing over the excess material, completes the compaction and leaves a smooth patch. In the case of bad break-ups in the concrete roads, we remove the area, repair the base and pour concrete. We then complete the job by either resurfacing the entire road, or by placing a lift of asphaltic concrete over the entire adjacent area.

We have about four ft. of frost in the winter so there are generally plenty of frost boils and breakups to repair. In fact, we utilize about one-half of our total annual tonnage in this sort of patching work.

Then by summer we are ready to go on our resurfacing work. In 1953 we completed 14 miles of road resurfacing, generally 22 ft. wide and

(Continued on page 90)

Table 1—Asphalt Tonnage and Cost

Year	*Tonnage*	*Cost per Ton*
1947	25,030	$2.89
1948	26,700	$3.36
1949	31,248	$3.368
1950	28,293	$3.48
1951	32,291	$3.976
1952	38,040	$3.648
1953	44,172	.....

● **LARGE Barber-Greene asphalt mixing plant installed by Ramsey County to meet increased demands.**

WATER FILTER PLANT FEATURES

Automatic Operation

LORING E. HANSON

Assistant Mechanical and Electrical Engineer,

East Bay Municipal Utility District

FACED with the problem of furnishing an adequate supply of filtered water to an area in which the demand has been increasing at a rate of approximately 20 percent compounded annually, and where annexations may jump demands by much larger percentages, the East Bay Municipal Utility District designed an expandable water filter plant which is semi-automatic in operation.

Located in Lafayette, California, the new Lafayette filter plant serves a suburban area, east of the Oakland-Berkeley Hills. At the present time, this section has an area of 44 square miles and includes the population centers of Orinda, Lafayette and Walnut Creek.

The rated capacity of the plant as initially constructed is 21.0 million gallons daily but many provisions have been made to allow the plant to be expanded to a capacity of 63.0 mgd with a minimum of alterations. The plant was first put into service in October 1953.

The first structure built was the Control Works which diverts raw water for the plant from the main aqueduct carrying Mokelumne River water to Oakland. A 72-inch sluice gate in the main aqueduct is kept normally closed thus forcing the entire flow to rise into a control basin through outlets in the top of the aqueduct. From this basin the filter plant draws water through a 72-inch influent pipeline. All water in excess of that required by the filter plant spills back into the main aqueduct through a "morning glory" spillway and continues on its way to Oakland. The head of water over the sand in the filter beds is determined by the level in this control basin, which level in turn is determined by the head required over the lip of the spillway to return the excess water to the aqueduct. The normal variation in head over the sand will be about one foot.

Filter Building

The filter structure, at present, is made up of four filter units, the raw and waste water channels, the pipe gallery and operating gallery. Each filter unit consists of two bifurcated filter beds with a combined sand area of 1240 square feet and a rated capacity of 5.25 million gallons daily based on a filtering rate of 3 gallons per minute per square foot of sand area.

Each filter unit is equipped with an 18-inch Builders-Providence rate controller; three 20-inch, one 18-inch and one 8-inch Rensselaer hydraulically operated square bottom gate valves; a Builders-Providence operating table with loss of head and rate of flow instruments; and one 30-inch and one 24-inch Olympic Foundry square sluice gates, with hydraulic cylinders.

The wash water tank is of prestressed concrete and has a capacity of 193,000 gallons which is sufficient to wash two filter units with one filling. This tank is filled by means of two pumps, with a combined capacity of 3000 gallons per minute, which are located in the pipe gallery of the filter building.

The waste water is discharged into a creek at a controlled rate from a regulating basin which receives all the waste water during a washing operation.

Filtered Water Distribution

The filtered water discharges into a clear-water tank of prestressed concrete which has a capacity of 332,000 gallons. A pumping plant building located adjacent to the clear-water tank houses four centrifugal pumps. Two units, 125 and 250 horsepower, pump to a zone 172 feet above the filter plant; and two units, each of 250 horsepower, pump to a zone 363 feet above the filter plant.

A supervisory rate setting valve, controlled from the pumping plant through a leased telephone line, has been installed in the 30-inch pipeline which supplies a third zone by gravity.

Electrical power for the entire installation is supplied through the District's substation which transforms 2000 KVA from 23,200 volts to 2400 volts and 150 KVA from 2400 volts to 480 volts. Emergency power can be provided by the 250 KW 2300 volt diesel powered generator.

Chemical Treatment

The only chemical treatment normally required is chlorination. This is provided by two Wallace and Tiernan vacuum chlorinators, with a combined capacity of 0.7 to 800 lbs. per day, which can feed the chlorine solution either to the influent or effluent. A Wallace and Tiernan Amperometric Residual Chlorine Recorder continuously samples the effluent and records the chlorine concentration. This instrument also transmits over a telephone circuit to a receiver located in the Orinda Filter Plant where operating personnel can keep a constant watch on the residual chlorine at Lafayette.

Since it will be necessary to add lime and alum to the water only on rare occasions, provision has been made to feed these chemicals on an emergency basis. Two "Omega" chemical feeders have been installed which have capacities of 65 lbs. per hour for lime and 500 lbs. per hour for alum. The solutions will be fed through temporary hose connections. Storage space has been provided for 12,000 lbs. of lime and 16,000 lbs. of alum. A propeller type flash mixer is located in the inlet to the influent pipeline.

Provisions for Expansion

The Raw Water Diversion Structure, the 72-inch influent and the 48-inch effluent pipelines are designed to handle the ultimate capacity of 63-million gallons daily.

The influent, effluent, wash water and waste water pipelines all enter the filter building at the east end so that new filter units can be added at the west end of the structure without changing or disturbing any of these main pipelines. Additional

filter units with their corresponding extensions of pipe and operating galleries, and raw and waste water channels, can be constructed in 10.5 MGD capacity pairs identical to the existing units.

The effluent venturi meter at present has a maximum capacity of 30 MGD at a deflection of 60 inches of water. Its capacity can be increased as required by substituting a larger throat section.

The pumping plant building has been constructed with space for two additional pumping units. One of these will be a 500-hp unit pumping to the zone 363 feet above the filters. The other will be a low head unit to boost the flow through the 30-inch gravity pipeline. The building, equipment and piping have also been arranged so that the building can be lengthened and additional pump units installed without disturbing any of the existing installation.

The chemical feeding equipment now installed is adequate to handle the ultimate capacity of the plant.

The present transformer substation can supply sufficient power to drive all of the pumps now installed plus the two additional units for which space has been provided in the pumping plant building.

Features Permitting Automatic Operation

The plant was designed to operate unattended except for occasional inspection and washing of the filter beds, and it is now being successfully operated in this manner.

The raw water diversion structure, previously described, is one of the most important structures in the scheme of automatic operation. It allows the filter plant to draw whatever water it requires from the flow passing through the aqueduct and at the same time maintains a fairly constant head of water over the sand in the filter beds, regardless of the rate of flow through the aqueduct or the flow to the filters.

The demand on the filter plant is created by the two pumping plants and the gravity line, which draw from the clear-water tank. As the water is drawn from the clear-water tank its level will drop to some point below the water surface over the sand. The difference between these two water levels will then be equal to the loss of head through the filter beds, plus minor pipeline friction. Thus if the rate at which water is drawn from the clear-water tank is increased, its level will fall a distance equal to the additional loss of head in the filters. If the flow out of the clear-water tank is stopped its level will rise and back water up through the filters and the influent pipe until all the flow in the aqueduct is spilling over the "morning glory" spillway.

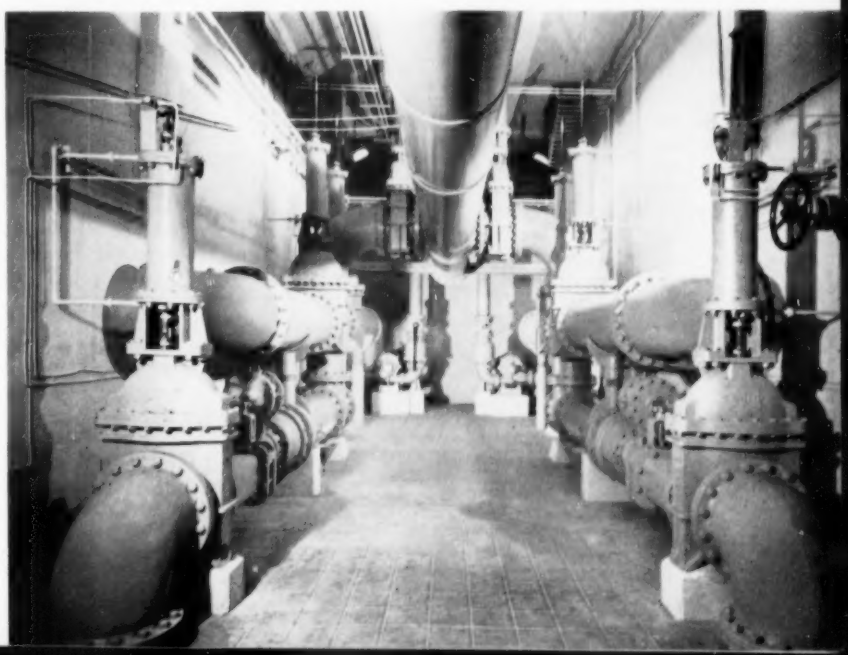
The chlorinators automatically proportion the rate of chlorine feed to the rate of flow by means of a differential converter connected to the effluent venturi. A Foxboro 2½-inch deflection instrument with a Rotax switch closes a Hydramotor operated valve in the water supply to the chlorinators when the flow approaches zero.

The four pumps which take suction from the clear-water tank are completely automatic in operation. They are started periodically by time switches and are stopped by pressure switches which are actuated by the increased discharge pressure due to a filled system.

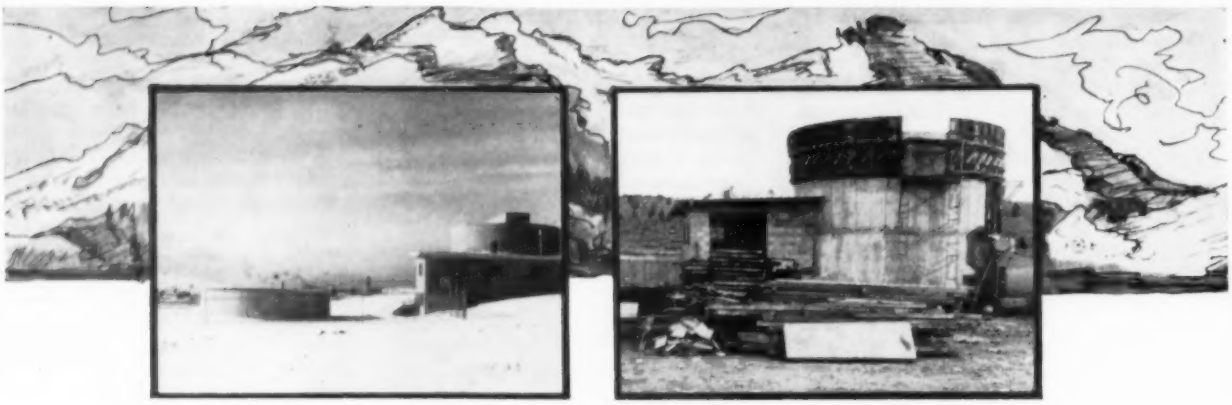
ENGINEERS AND CONTRACTORS — Design of the entire installation was by engineers of the East Bay Municipal Utility District under the direction of Robert C. Kennedy, Chief Engineer, with Louis Bosa, Senior Civil Engineer, as project engineer under the supervision of J. W. Trahern, Supervising Civil Engineer and Leslie Paul, Supervising Mechanical and Electrical Engineer.

The major part of the construction was done by Elmer J. Freethy, Contractor, of El Cerrito, California.

● **OPERATING gallery is located in the filter building to control operation of four filter units having a total area of 2480 sq. ft. and 21 mgd capacity.**



● **PIPE gallery: new filter units can be added to increase capacity to 63 mgd without disturbing any piping.**



● HIGH in the Rockies, there's snow on Leadville's new plant.

● DIGESTER and control building shown here during construction.

Sewer System and Treatment

ROBERT Q. BOYCE,

Ripple & Howe,

Consulting Engineers

THE highest City in the United States is Leadville, Colorado, County Seat of Lake County. The elevation at the U. S. Post Office is 10,140 ft. above sea level and the sewer system serving the city ranges from 9950 ft. to 10,290 ft. above sea level.

Metal mining and refining are the principal businesses in the area and since by nature the industry is either up or down financially, relatively few permanent civic improvements other than schools have been attempted with success. The population of the City has fluctuated from in excess of 35,000 persons to below the present 4100. Water is supplied by a private company through a unique steam heated system. At the turn of the century a private company furnished manufactured gas to the city, a venture soon proved uneconomical.

The sewer system traces the growth of the community. The City is bounded along its southern edge by California Gulch where the first gold strike was made. The first businesses were established along the Gulch and growth went upgrade to the north from the Gulch. As each building was constructed another length of sewer was extended from that last installed to flow into the Gulch.

When Ripple and Howe, Consulting Engineers of Denver, made a preliminary survey for construction of a sewer system and sewage treatment plant in 1947 it was found that only about 10 percent of the city was sewered. All of the major business houses and a group of homes were discharging sewage into an ancient covered Imhoff tank approximately 25 feet square. The Imhoff tank had long since become overloaded to the extent that no treatment or settling was provided.

The sewer system consisted of over 3 miles of sewer pipes of assorted sizes; the largest sewer was 8 inches in diameter and a major portion of the system was 4-inch pipe. Most bends, changes of direction, and grade changes were made without benefit of manholes. Only about a dozen manholes were installed in the entire 3-mile system.

Because the funds available were limited and construction necessarily had to be accomplished at a minimum cost, it was proposed to sewer that portion of the community not then sewered, provide primary treatment and not disturb the existing system except to divert the sewage into the new lines for treatment.

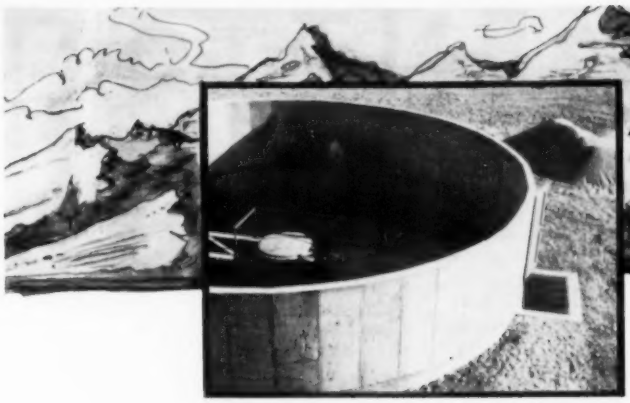
It was found that such a project was beyond the means of the city government and a sanitation district was created to take over the problem. At the time the report was presented, the economic picture was such that the project was again postponed.

In the Spring of 1952 the Board of Directors of the Sanitation District felt that a favorable period for the metals industry indicated that a bond issue for such a system might be approved and on this basis asked an election for $200,000 of general obligation bonds. When the bonds were approved, the engineers were authorized to ask for bids on the sewer system and treatment plant.

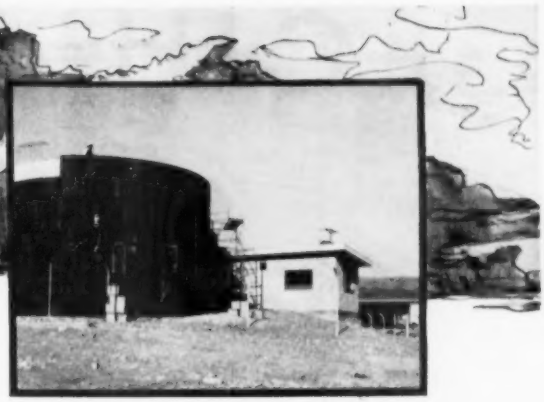
Sewer System

Schmidt Construction Company of Grand Junction, Colorado, was awarded the contract for approximately ten miles of vitrified clay sewer lines ranging in size from 8-inch to 15-inch. The average cut within the system was seven feet and although Leadville is in the mountains and is surrounded by the highest peaks in Colorado, no rock excavation was encountered.

In order that the northern end of the city, including a Federal Housing project of 88 units, could be served by gravity, it was necessary that about 4,000 feet of line be placed on minimum grade around a large hill which separates the portions of the City. The grades within the system varied from the minimum grade for scouring velocity to a maximum of 10 percent. Four rail-



● MESSRS. Irwin and Vaseen are shown on the walkway of clarifier.



● DIGESTER is insulated with 2 inches of spun glass and stuccoed.

Plant is high in the Rockies

road crossings and 3 highway crossings were expedited through the cooperation of the authorities in allowing use of open-cut methods.

Sewage Treatment Plant

The design of the sewage treatment plant was dictated by the altitude, the climate, and the funds available. The effluent from the plant was to be discharged through California Gulch to the Arkansas River. The Arkansas River has been called the "Cesspool of Colorado" since of all the communities discharging sewage into it, only two were providing even primary treatment. As a start in the proper direction a primary treatment plant consisting of grit channel, comminutor, heated digester, and maintenance building was selected.

Because the temperature has at times remained below zero for an extended period of time and because the snow depth would interfere with the operation of open structures, the control building was designed with sufficient length to enclose the grit channel and comminutor within the lower level.

The primary clarifier has a 30-ft. diameter and 9 ft. swd, with the effluent channel at approximate ground level. A 6-inch reinforced concrete wall was extended upward to enclose the tank and prevent snow from blowing into the clarifier. Because the wall prevented cleaning the weirs in the normal manner an interior walkway and handrail was constructed to facilitate maintenance. The abnormal 40-foot length of the control building required by the grit channel and the 6-foot depth of the outfall necessitated the construction of a two-level building. All pumps, controls and the digester heater are located on the lower floor while an office and garage are on the upper level. The digester is constructed in a manner which forms one wall of both levels of the building. The walls of the lower floor are of reinforced concrete as is the floor of the second level. The upper walls are concrete block and the roof is wooden with a tar and gravel surface. A garage at ground level consumes the major portion of the upper level while an 8 x 10-ft. office occupies the balance of the space.

Building heat is provided by means of a hot water radiant heat system supplied from the digester heater. The coils of the heating system are embedded in the floor of the upper level and provide a temperature of 45° to 50° in the working spaces and garage while the office is kept at a comfortable 70° F.

The digester, 32 ft. in diameter and 30 ft. swd, was insulated with 2 inches of spun glass and covered with Portland cement stucco; 1½-inch wrought iron pipes at varying centers were installed in the digester walls to provide warm wall digestion and thus, with the sludge recirculation, aid in retaining proper digester heat at minimum operation costs. The digester cover is fixed reinforced concrete with a beam-type gas collection dome and is equipped with PFT gas collection equipment.

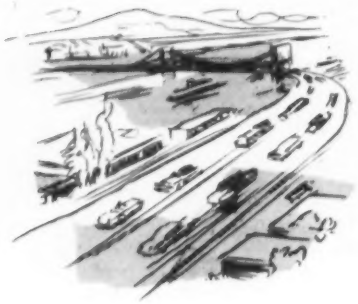
The Administrative work for the system was handled by the Board of Directors, composed of E. J. Kelly, President; Emmett Irwin, Secretary-Treasurer and Members: Frank Kostelc, Harold J. Trevethan, and Lloyd E. Evans. Ripple and Howe, Denver, were Consulting Engineers on the project and John O'Rourke, Sewer Superintendent, handled inspection on the project.

The cost of the entire project was $235,000 with $150,000 spent for the sewer system and $85,000 for the sewage treatment plant which was constructed by Choun Construction Co. of Denver.

The bond issue was $200,000. The additional monies required were obtained through collection of a $50 tap fee. The sewers were thus extended beyond the original proposal.

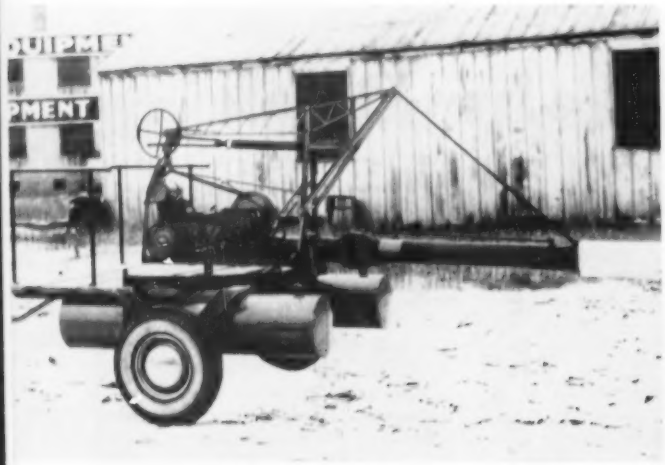
The Sanitation Board has required that all homes on the sewer lines be sewered by August 1, 1954, and thus after a troubled and turbulent life of nearly 100 years, Leadville has finally solved its sanitation problem; and to the surprise of many and the gratification of the Board of Directors, no service charge is required for payment of the bonds, an 8 mill levy furnishing all necessary funds.

EQUIPMENT FOR



THIS material is reproduced by courtesy of the Highway Research Board from their publication 286 which is the report of the committee on Roadside Development. This particular portion of the report concerns the mechanization of roadside operations.

Rapidly rising labor costs have made it necessary for highway landscape architects and engineers and others responsible for roadside work to substitute machines for hand labor wherever possible. The items shown have been reported to the committee by the users and have been found to do the required job efficiently and economically. Some have been developed by the organization using them and others are commercially available machines. In some instances the standard



● **WEED** burner operates by pressure atomization of oil by means of a rotary pump with air for combustion furnished by a steel pressure blower. Cuts swath 5 ft. wide at 6 mph.

● **CHIPPER** with cylindrical cutter head carrying blades and adjustable bed knife mounted in housing base. Will grind branches up to 6 inches in diameter at rapid rate.

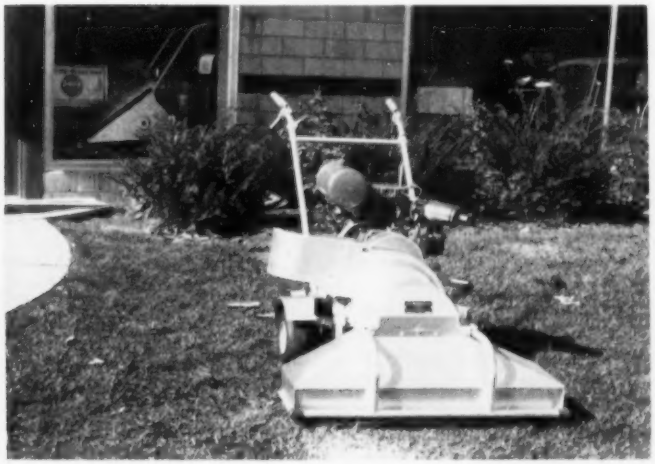
● **TRACTOR** dozer blade for attachment to a tractor equipped with a Da West front end loader cuts down sections of shoulders underneath guard rails and around obstructions.

● **SPRAYER** is mounted on any type of truck, one ton or larger. Driver controls 22-ft. boom which has 15 nozzles spaced 18 inches apart. Pressure supplied by a centrifugal pump.

ROADSIDE MAINTENANCE

equipment has been modified and thus adapted to do jobs beyond those for which it was originally designed.

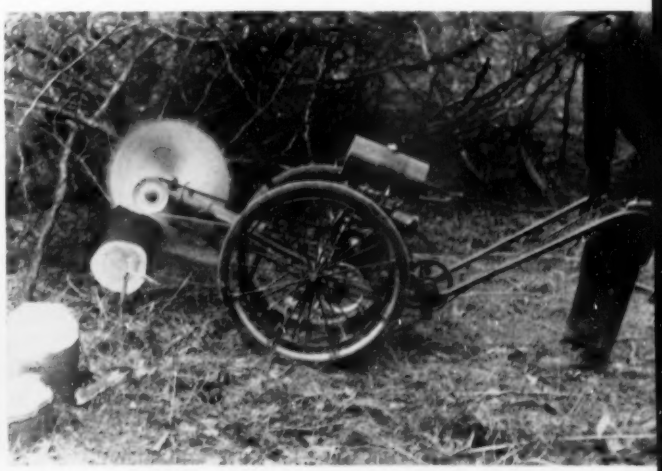
Many roadside organizations operate on a very limited budget and are forced to make every dollar count. If these machines had not been available much of the roadside work could not have been done at all because of lack of funds. The use of this type of equipment also frees labor to do work which, because of peculiar conditions, must be done by hand. There will probably always be a considerable amount of that type of work in roadside operations. However, such hand labor can be reduced to the minimum through prompt investigation and adoption of new machines developed for roadside maintenance and allied work.



● **LEAF** sweeper picks up leaves in a 3-foot swath by vacuum suction only. It thoroughly mulches the leaves and the fine mulch is blown to one side or gathered in a container.

● **SEED** sprayer is used to spray seed on prepared seedbed areas. Water from a 750 gal. tank carries the seeds. Spray nozzle is 1 1/2-in. pipe flattened to make a 3/16-in. opening.

● **WEED** control machine is pulled by a tractor and used to shatter vegetation. Has commercial Roto-Beater 80 inches in width equipped with steel hammers with hard tips.



● **SAW** blade attachment for mower. Has heavy duty wheels with semi-pneumatic tires. Powered by Clinton 1½ or 3-hp engine. Finger-tip-control clutch lever and throttle.

MERCURY VAPOR LIGHTING *for a* HEAVILY TRAVELED THOROUGHFARE

A NEW type of pole, made of pre-stressed reinforced concrete, supports the street lighting system recently installed in the business district of La Grange, Ill., near Chicago. The project involved putting up 107 30-foot poles holding General Electric Form 109 mercury vapor luminaires. Cost of the new system, which replaced a series of lantern-type incandescent lights mounted on 12-foot concrete poles, was about $144,000. According to Village Superintendent Robert A. Finley, the new lights give about five times as much illumination as the old ones, at no increase in operating cost.

The poles are made by American Concrete Corp., Chicago. The pre-stressing process consists of placing the wires in the concrete mold used to form the poles, stretching these wires with a hydraulic vise that exerts a pressure of 150,000 psi, then pouring the concrete into the mold under pressure. The mold is rotated at high speed. The centrifugal force thus generated throws the concrete mixture outward against the mold, completely embedding the steel.

The tension in the steel puts the concrete in compression. This produces increased resistance to weathering and high winds, according to Mr. Finley. The reason, he says, is that the concrete, being under constant compression, undergoes minimum expansion and contraction with changes in weather; and the surface remains moisture tight.

Installation of the new system solved a serious traffic hazard. The village's main street, La Grange Rd., is a heavily-traveled U. S. highway. The output of the old lantern-type street lights, a meagre 4,000 lumens, left most of this thoroughfare in darkness. Ogden Ave., another heavily traveled street covered by the program, was little better off.

Besides the traffic problem, the old lights were undependable. They were wired in such a way that if two lights burned out, the whole system failed. The fact that an accurate wiring diagram was unavailable made servicing extremely difficult.

The new lights were financed mainly through 10-year special assessment bonds. The bonds were levied against merchants and other businessmen who own property along the affected streets. The bonds paid $135,000 of the total cost of the project. The rest of the money came from state motor fuel tax money.

The new lights are powered by a 600-volt, three-line system, laid three feet below grade. Transformers in the base of each pole provide the 240 volts necessary for the luminaires. Two of the lines contain the high voltage, while the third acts as a common return to the power source.

This three-line system provides two types of service. Lights at the intersections of busy streets, and about half of those along each block, are kept on all night. They are hooked up to one of the 600-volt lines. Also, each of these poles contains an outlet for decorative lights. These latter circuits are also connected with the "all night" power line.

The rest of the new street lights are connected to the second 600-volt power line. The current in this line

(*Continued on page* 88)

● **GENERAL Electric mercury vapor luminaires mounted on American Concrete Corp. reinforced concrete poles.**

● THIS is the machine that was used at the Auckland City Council Pilot Plant for turning heaps of refuse and for spreading and loading finished compost.

Refuse Composting Developments in New Zealand

R. C. LOUGH

Assistant Designing Engineer,

Ministry of Works,

Wellington, New Zealand.

TWO interim reports have been issued on this subject by the Interdepartmental Committee on Utilization of Organic Wastes. The data presented here supplement those reports. A Third Interim Report will be published later this year.

Since the Second Report was issued, experimental work has been carried on at the Auckland City Council pilot plant. Trials were made using raw sewage sludge and digested undried sludge along with the refuse. The former was most effective as its use resulted in temperature increases of 10° to 15°F in the silo, while the latter had little effect. It was not possible to try air dried digested sludge, which should permit a much larger proportion of sludge to be used and should result in the least danger to health. Underdrainage of the maturing heaps was found to be unnecessary. Turning the heaps is considered best for it provides both mixing and aeration. To assist in aeration and to provide a ground covering, 6 ins. of sawdust is placed as a base for the heaps. The addition of sawdust to the compost was considered, but was not tried as experience has shown that its use results in an inferior end product.

Analyses of Waste: Following are average figures for crushed raw refuse after extraction of unwanted materials such as glass, crockery, tins, metals, etc.: Density, loose, at field moisture content, 36.6 lbs. per cu. ft. or 987 lbs. per cu. yd.; field moisture content, wet weight basis, 60 percent; pH 4.9; carbon percent 48.3; nitrogen percent 1.74; and C/N ratio 27.9.

In the Second Interim Report the age to reach a carbon-nitrogen ratio of 15 was reported as 20 weeks. Longer experience indicates that 30 weeks will be required to reach a ratio of 15. If a ratio of 18 is considered sufficient, and raw sludge is added, 18 weeks should be enough.

Growing experiments are planned for a long-time test, using various kinds of vegetables. Previously, data were presented in the Second Interim Report covering fertilizer value in terms of inorganic constituents — nitrogen, phosphate and potash.

The possible application of composting to larger communities may be studied on the basis of the Auckland pilot plant, which is a fully mechanized installation; and on the basis of the compost works as Masterton, a town of 12,000 population.

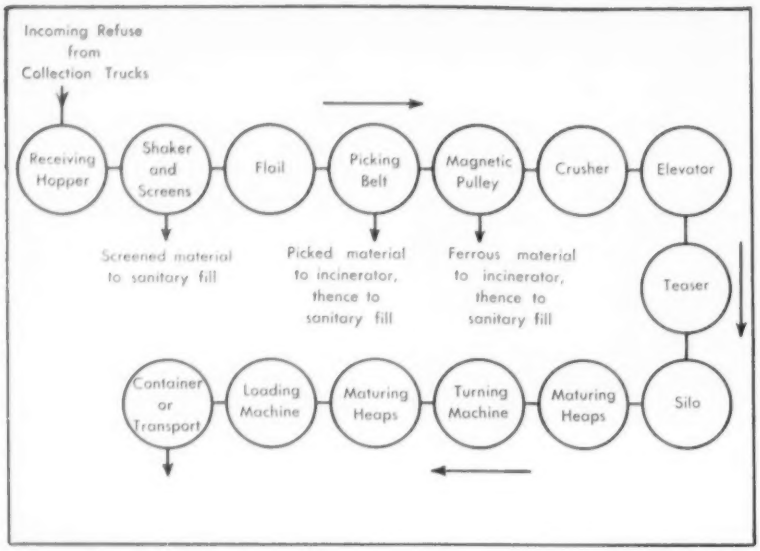
Auckland Type Plant: The flow diagram herewith shows the pilot plant as now operating and, in a general way, the scaling up to serve a town of 10,000 to 20,000 people.

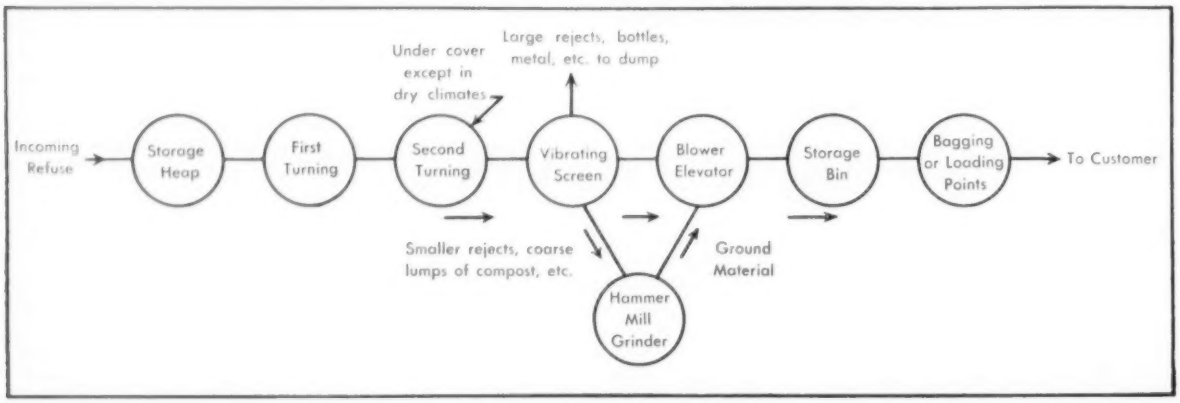
The receiving hopper described in the Second Report was a shallow one. If site conditions permit, a deep hopper would be better, with the raw material dumped into the top and removal from the bottom by a screw feed. This would necessitate picking large objects out of the refuse before dumping into the hopper. The capacity of the hopper must be such that peak deliveries and reasonable breakdown periods can be cared for—at least one day's delivery of raw refuse would be the minimum capacity. Storage in open yards would be objectionable and the Health Department would almost certainly prohibit it. Also, material stored in the open would become sodden in rainy weather and this would cause difficulty with subsequent composting.

A picking belt is necessary to permit removal of glass and other undesirable matter. It is estimated that 40 hours of labor would be needed for this work for every 2500 to 3000 population served. If a magnetic remover were used, glass and crockery would remain in the refuse and the greater content of such crushed material might be objectionable in the end product. A hammer mill, such as the Gruendler or the Lightning, is necessary; and, if used, a teaser is necessary, also, so that the material is "fluffed up" before entering the silo. A blower for elevating the material to the silo may be best.

The pilot plant included a silo for first stage composting, the raw material being fed in at the top and the partly composted material being removed from the bottom. The depth of material was maintained at about 6 ft., with a retention period of 2 weeks. For a larger plant, the same depth and overall retention are considered best; and if a large structure is used for the silo, it might be divided into smaller compartments. By turning from compartment to compartment, temperatures would be improved. If sloping ground were available, the compartments could be stepped and turning would be easier. When silos are being properly operated, there should be little or no drainage water collecting at the bottom.

Maturing yard space should be





● **FLOW diagrams: Auckland City Council pilot plant at left; the Masterton compost plant beneath.**

provided for about 9 months output. Compost made in the autumn may not be sold until spring. Covering of the maturing yard would be desirable.

The turning and loading machine used at the pilot plant was made locally and is far larger than needed. It incorporates a shredder which breaks up the material into small particles. It does not require continuous attention. The plant operator starts the machine and then continues his belt picking work until the machine reaches the end of the windrow or requires other attention. A Barber-Greene or similar loader, to which a shredder could be attached, would possibly be better.

Gravity flow through the whole plant is very desirable and should be provided if site conditions permit.

The Masterton Works

In this plant, incoming refuse trucks dump their contents at the end of a long heap where the refuse is banked as high as possible. When a heap has been completed, it is covered with a thin layer of sawdust to protect it from flies. After about 6 weeks it is turned and after another 6 weeks it is turned again in readiness for final processing and sale. This turning is done at present by a hired bulldozer. A machine of the Barber-Greene loader type would be an improvement as it would be better for turning and could also be used for loading from the piles onto the screen.

When the heaps are turned the second time, the material is placed in a heap under cover to mature fully. When it has been turned twice and has matured sufficiently—usually 12 to 15 weeks—it is lifted onto a 3-level vibrating screen which has screen openings of 3 sizes—1 in., ½ inch and ⅛ in. The material passing the ⅛-in. screen is raised to a bin by a blower elevator. The material rejected by the ½-in. and ⅛-in. screens, which is mainly lumps of compost material, is passed to a small hammer mill grinder and then mixed with the other fine material. The rejects larger than 1-in., which include all sorts of metal objects, bottles, etc., are removed and dumped.

The refuse from a population of 12,000 is dealt with at this plant by 3 men. The Borough Council collects and delivers all refuse to the works and pays a yearly sum for disposal. The compost sells for about 8 pounds ($22.40) per ton and the demand is always greater than the supply. About 550 tons of compost are produced annually, or about 0.04 ton per person per year.

Other Composting Processes

None of the patented or special processes, such as Earp-Thomas, Dano or Frazer-Eweson have been used in New Zealand as yet. The methods used here have required longer periods for the production of what is considered satisfactory compost. The only disadvantage of the longer composting period is the greater storage space required, and in some cases greater silo capacity; but usually ample land area is available and it is probable that the methods used here produce compost at a lower cost.

Acknowledgements: The suggestions and recommendations in respect to the Auckland plant and its applicability to larger installation are based, in part, on discussions with G. A. Hutchinson and with Mr. Simmons of the Auckland City Engineer's Office.

• • •

More Safety on the Thru-ways

The fatality rate on the California rural State Highway System as a whole is 11.39 per 100 million vehicle-miles; while on full freeways the rate is ony 2.54 per 100 million vehicle-miles.

Getting FRESH WATER *for* ST. AUGUSTINE

GUY BROWNING ARTHUR

ST. AUGUSTINE has plenty of water, for the Matanzas, North and San Sebastian rivers cut it into neat sections, but all of this water is salt or brackish. The town is here because a Spanish fleet scurried into the Matanzas River nearly 400 years ago to escape the French, the first settlers of Florida, and took over an Indian village which became the city. Deep water channels are as much a part of the city as the land, which averages only six feet above sea level.

Yet good water is pumped from wells less than 100 feet deep. It flows down from the highlands in the middle of the state over a thick layer of marl, and accumulates in limestone strata formed of coquina shell with voids which run as high as 18%. The limestone is a perfect filter, and wells driven almost through it tap an unlimited supply of good water.

The present well field is about two miles from the city, and 15 wells 65 to 90 ft. deep produce the entire supply of 1.8 MGD in the winter and 2.5 MGD in the summer. A new well field of 72 acres is being purchased, from which still better water will be pumped, for the coquina shell bed in this field is 35 ft. thick. Wells in this field will not be deeper than the present ones.

Another good reason for shifting to the new field is that the present field is in small parcels, and it is difficult—practically impossible—to protect the area from contamination. The new field is in one piece, and can be fenced and protected. It may be possible to have the state take steps to prevent trespassing and insure isolation of the area.

Other cities may envy the simplicity of getting good water in a place where that would seem to be most difficult. They will wonder more when learning that these wells cost only $5000 each. The cost of the entire water system for this city of 18,000, with 5000 winter visitors, is lower than for most cities of the same size.

The water plant occupies six acres in a residential section. It looks more like a hospital than a utility. The main building is 85 ft. x 60 ft., built of red brick with pre-cast trim and a concrete slab roof. The pump house, across the entrance road, is of the same construction, and is 55 ft. x 40 ft. Both buildings are set well back in a lawn.

Behind the pump house is a half-buried million-gallon concrete storage tank, and also the 300,000-gal. elevated steel tank shining with aluminum paint. The new mixing tank and the settling basin structure are almost out of sight behind the main building. Far back in the property, on the railroad siding, are the lime storage building and steel silo.

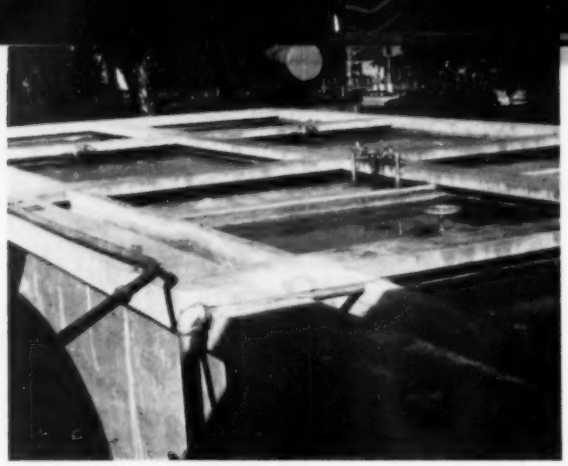
In the main building are three filters 18 x 20 ft. in area. Under these is the clear water tank, 10 ft. deep. The third filter was added in the improving and enlarging program which was completed last October, extending the building to make space for it. The laboratory and superintendent's office are on the second floor. All mixing and measuring of chemicals is done on the basement floor.

The layout of the plant has not been changed materially, but the Walker system of mixing and coagulating was installed in this program. The tank is directly behind the main building, and is 55 ft in diameter. The central mixing chamber is 16 ft. in diameter, and the intermediate compartment 26 ft.

The treatment process is keyed to the extreme hardness of the water. A typical analysis shows total solids at 429 parts per million,

● **TWO TANKS: Elevated tank is shown towering above half-buried million-gal. concrete storage tank**

● **MIXING and coagulation tank was installed at the rear of the main building. Pumps show above structure.**



● **LOOKING across sedimentation basins, showing recarbonation units installed to remove caustic alkalinity.**

calcium 119, carbonate ion 349, carbonate hardness 286, and total hardness 312. Daily quantities for treatment at present are an average of 3000 lbs. of lime, 300 lbs. of soda ash, 45 lbs. of ammonia, 25 lbs. of sodium silicate, and 28 lbs. of chlorine.

Water comes through a 16-in. main from the well field to the mixing tank which was installed by Walker Process. High calcium lime, slaked into milk of lime, is fed by the Omega gravimetric feeder in the storage house on the railroad siding, and pumped across the property to the flocculating tank. Clogging of the milk of lime pipe caused trouble for a time, but treated water from the top of the mixing tank was returned to the feeding end of the line to reduce the clogging.

Measuring of dolomitic powdered lime for inducing coagulation, activated silica, soda ash and chlorine is done in the mixing room in the basement of the main building. Omega measuring machines, like the feeder, were supplied by Builders Providence.

Treated water from the flocculating basin flows into the four settling basins, where practically all settling is completed. Next comes the recarbonating section, where CO_2 gas is applied to overcome the caustic alkalinity in the treated water. On the near side of the recarbonating tank are four other settling basins, and from these the water passes into the filters.

The filters are built with 18 ins. of gravel under 30 ins. of sand. Flow is controlled by Simplex equipment. Design capacity is 5 MGD through the filters, but at present the flow is about 1.8 MGD during the winter and 2.5 MGD in the summer. The increase in population during the winter, when 5000 visitors from the North come to bask in St. Augustine's Florida sunshine, doesn't raise the consumption as much as sprinkling lawns during the hot season.

Filtering through the sand and gravel, treated water passes into the clear water tank which covers the area under the filters. From here it is pumped to the underground storage tank, and into the elevated tanks and standpipe. An 8-in. main, slung under the Bridge of Lions across Matanzas River, now supplies Anastasia Island, but bids have been taken on an additional 10-in. main to make sure of an adequate supply even if the present 8-in. main should be damaged.

One Fairbanks-Morse 3000-gpm pump, the main unit in the pump house, handles the supply throughout the system during the day. Another F-M unit of half that capacity pumps the supply during the night. Pressure in the system is maintained at 70 lbs. in the daytime, and 80 lbs. at night.

Lime is received in bulk in railroad cars, and blown into the storage bins by a Dracco automatic lime unloader.

In this location the disposition of sludge is not a problem. The plant uses 1½ tons of lime a day, and produces 4 to 5 tons of sludge. Though this sludge has considerable value for improving agricultural land, it is at present wasted in a marsh.

A bond issue provided $400,000 for the improvement program. The third filter with the necessary addition to the main building cost $121,000, and about $20,000 more was spent on electrical installations. Other items in the program were the treatment system, four new wells in the present field, and re-roofing the concrete reservoir. About $325,000 has been spent on the program. The city purchased all mechanical equipment.

Black & Associates, of Gainesville, Florida, were the engineers. The contractor was Ranier & Cambron, of Orlando, Florida. A. C. Pomar has been superintendent of the plant since 1942. J. H. Lauper, City Engineer, represented the city in the construction of the main building extension and other parts of the program, under the direction of Marvin H. Grier, City Manager.

This improvement program, with the new well field, insures a supply of fresh water more than double present requirements. There is no danger here that the water table will be lowered, for the natural beds of coquina limestone appear inexhaustible.

• • •

Minnesota to Test Use of Red Stop Signs

Several heavily travelled highways and road junctions have been selected by the Minnesota State Highway Department for experimental tests of the effectiveness of new types of highway signs and traffic control devices as a part of the Department's continuing efforts to find ways of reducing traffic accidents.

Among the innovations to be tried out by the Department on state trunk routes will be utilization of red reflectorized stop signs along certain key routes. During the experimental period for evaluating any additional element of traffic protection which the red stop signs might afford, governing bodies of cities and counties which may wish to undertake similar trial programs will be authorized to install the reflectorized red stop signs on test locations, in place of the standard black and yellow "stop" sign.

In authorizing the test of the red stop signs, Minnesota is following an experimental pattern recently adopted in 12 states and under study by 15 additional states. The test is to determine principally whether the distinctive red "stop" sign will result in better motorist obedience and subsequent reduction in the number of accidents.

LET'S CONTROL CURB PARKING SPACE

HAROLD L. MICHAEL
Joint Highway Research Project,
Purdue University

IT is increasingly realized that traffic can move faster and parking can be accommodated more efficiently if the two operations are separated. The result has been a trend toward the elimination of parking at the curb. Streets and highways were built for traffic movement—not for the storage of vehicles—and future traffic will undoubtedly require the full width of most streets. The modern street or highway facility rarely includes provisions for parking; parking is generally prohibited on-street and encouraged through elements of the design to occur at convenient off-street parking facilities.

The day of no on-street parking, however, has not arrived, and the demand still exists for curb parking at the front door of every business. Although the city traffic engineer has the responsibility of eliminating curb parking to speed the flow of moving traffic, he also has the responsibility of encouraging maximum use of all off-street and all remaining on-street parking facilities. Since curb spaces usually exist—especially in the smaller cities—in almost every block of the central business district, how can he insure their use for the best interests of the whole city? An answer to that question is the purpose of this article.

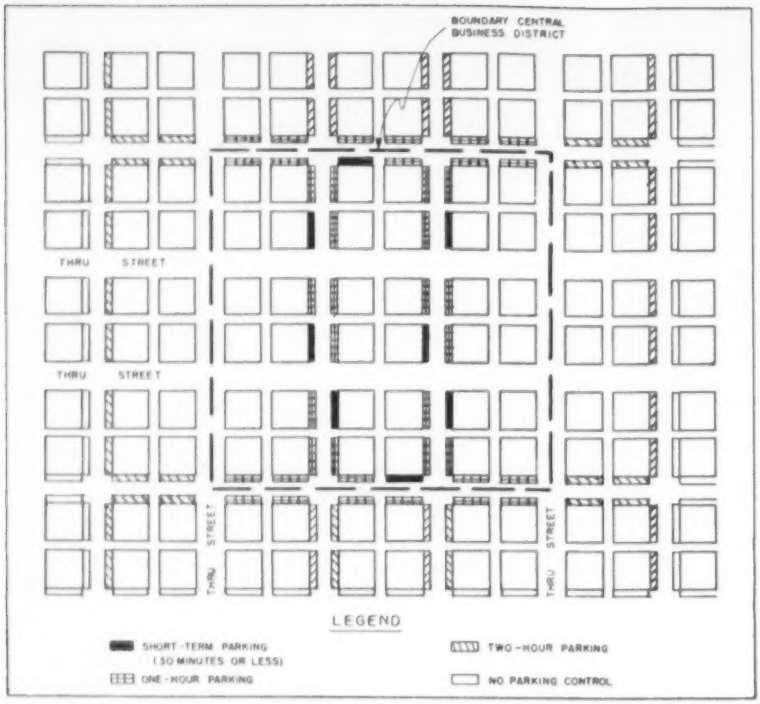
Four Classes of Parking

The motor vehicle operators who wish to park have generally been classified into four large groups: (1) the errand parker; (2) the shopping parker; (3) the employee parker; and (4) the loader or unloader. The reason for parking by each of these various groups is quite obvious: the errand parker to accomplish a single mission; the shopping parker to purchase supplies at several locations; the employee parker to work; and the loader to load or unload a bulky article. Studies of the length of time that members of each of these groups desire to park have indicated large time-desire differences between them. These studies place the approximate length of desired parking time at: (1) errand parker—30 minutes or less; (2) shopping parker—one to two hours; (3) employee parker—four hours or more; (4) loader—variable with type of business, but often only a few minutes.

Similar studies show that the errand parker will walk only very short distances, and that he will drive a considerable distance to a business where he can park nearby. It is this trait of the motorist which has contributed to the building of the many and varied drive-in services that now dot the cities of America. If the central business districts of our cities are to retain a part of this trade, parking space in the central district must certainly be provided. Some merchant groups and city administrations are providing customer or public parking lots that give a break to this short-time parker. Such solutions should continue to be encouraged.

The construction of adequate space for all parkers is impractical and economically unsound in some areas in many cities, especially in small cities (10,000 to 50,000 population). It is in these cities, however, that adequate curb space may still be available. Theoretically, one curb space, on the basis of average time parked, will provide storage space for about twelve errand parkers or for three shopping parkers in the same time period that one employee parker can be accommodated. Because of this characteristic turnover as well as the walking-distance factor, it follows sensibly that errand parkers should be accommodated nearest to the destination, shopping parkers next closest, and the employee parkers the farthest away. The destination is, of course, the central business district and groups of spaces for errand parkers should be scattered throughout this district. For purposes of efficient traffic movement, they probably should not be located on the principal streets, as the increased parking movements necessarily cause additional traffic delay. Several spaces, perhaps all the spaces in a half block, for a certain class of parker should be provided together, so as to discourage cruising on all streets in order to find a vacant space. A simplified arrangement of spaces in a central business district for such parking allocation is shown in Figure 1. In this example, parking is

● PARKING meters do provide self-enforcing control of the use of street curb parking area.



● **CURB space allocation, Fig. 1, in a business district to various classes of parkers. Time allowed varies from 30 minutes or less to unlimited parking.**

prohibited on the principal streets, all curb parking on the minor streets in the central area is either one-hour or short-time parking (30 minutes, perhaps), and the curb spaces just outside the central area are limited to two-hour parking. The short-time spaces are in half-block groups with the number of spaces for each type of parking dependent on the demand as ascertained in a parking study.

If at all possible, the loader should use off-street space, but if such space is not available, this type of parker must be accommodated by adequate loading zones as near as possible to the place of business.

Self-enforcing Control

Even after such a parking plan has been devised, the problem still exists of regulation or control of the curb space, so as to insure its proper use by the several classes of parkers. Some method that is self-enforcing, or that requires a minimum of expensive enforcement is the most desirable. And here enters the parking meter.

Although parking meters are as firmly established for the control of the parked vehicle as the traffic light is for the control of the moving vehicle, there is perhaps no other traffic control measure which is so generally misunderstood. The popular conception by the public, the motorist, and even by many engineers and city officials, is that the parking meter is a simple and easy way to extract some much-needed revenue from the pockets of the parker. In many cities the decision relative to the installation of parking meters is determined on the basis of the additional revenue to be obtained. The meters, as a result, often are not installed according to sound engineering practice. They may be located in areas where there is little demand for parking space; or long-time meters may be located in the very heart of the business district; or parking for more than the legal time limit is allowed if the motorist "feeds" the meter.

Such practices, of course, do not result in more space turnover. In fact, they could lead to parking conditions which would be worse than those previous to meter installation, since they would give a legal authorization to the long-period parking practices of employees and shopowners.

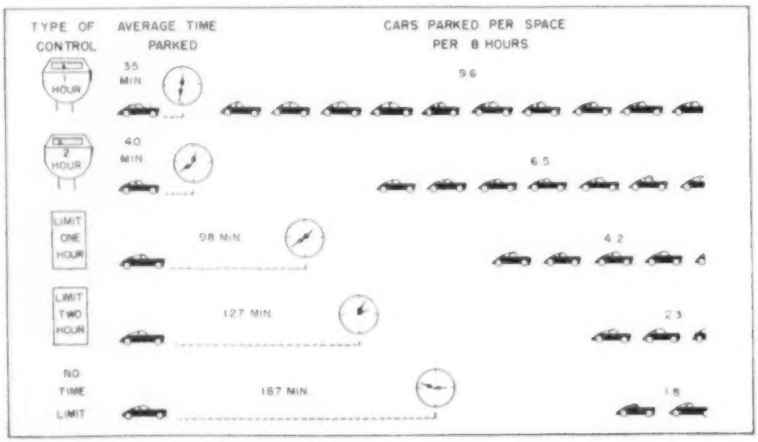
The original and primary purpose of meters is to provide a more rapid turnover of parking space in those areas of high parking demand. That should still be the principal purpose of meters, and their location should be determined with that purpose, and that purpose only, in mind. True, meters do supply much-needed revenue and this value cannot be overlooked, but that value must remain a secondary one.

A recent comprehensive traffic

TABLE 1—Usage of PARKING SPACE AT CURB

Typical Eight-Hour Business Day In One Indiana City

Type Parking Control	*Avg. Time Parked (Minutes)*	*Avg. Number Cars/Space*
1-hr. Parking Meters	34.8	9.6
2-hr. Parking Meters	39.6	6.5
1-hr. Parking Signs	98.3	4.2
2-hr. Parking Signs	126.6	2.3
No Control	167.4	1.8



● **DIAGRAM, Fig. 2, showing average time parked and number of cars per space.**

survey in an Indiana city has provided some interesting data on the turnover abilities of parking meters. This city of about 35,000 population has the usual too-little amount of parking space in the central business district, and subjects it to five conditions of control. Parking meters are used in the very heart of the district, and parking limit signs or no control at all are used for the remaining spaces. Both the metered and signed zones are further divided into one-hour and two-hour time limit areas.

The actual effects of these five conditions of control were observed and recorded during an eight-hour period on a typical business day. The summary of the average time parked per vehicle and the average turnover of vehicles per parking space is shown in Table 1 and Figure 2. The average time parked at each type of space is the most comparative figure shown, as the turnover is dependent on demand and the demand naturally was highest in the heart of the central district —where the one-hour meters were located. Parking metered spaces, both one and two-hour, had an average occupancy time of less than 40 minutes with one-hour meters providing faster turnover. On the other hand, the average parking time at the signed limit spaces was greater than the legal parking time, and almost three times that of the metered spaces. The average time at the uncontrolled spaces was still longer, more than four times that of the metered spaces, but only about one and one-half times that of the signed spaces.

The enforcement of the parking restrictions would certainly have had some effect on these results. It was found, however, that in general, only a voluntary enforcement campaign existed in all areas during the study. A few traffic tickets were issued to violators of parking meters because proper payment had not been made, but even this was not rigidly enforced. In the one-hour-metered spaces, for example, 13 percent of all vehicles were parked overtime, of which none received a parking violation ticket on the day that the study was in progress.

Evidently then, the motorist voluntarily and more closely obeyed the restrictions imposed by the parking meter than those declared by the parking-limit signs. Obviously, large numbers of violations occurred in the signed spaces. This is borne out by the data of Table 2. Violations were a maximum for the signed spaces (21.9 percent), and a minimum for the two-hour-metered spaces (7.0 percent). The percentage of long-time parkers in the signed spaces is of special significance, since such parkers are obviously detrimental to good parking conditions.

TABLE 2—VIOLATIONS OF TIME LIMITS ON CURB PARKING SPACES

Typical Eight-Hour Business Day In One Indiana City

Type Parking Control	Percentage Violations	Percentage Over 4 Hrs.	Percentage Over 8 Hrs.
1-hr. Parking Meters	13.0	0.1	0.0
2-hr. Parking Meters	7.0	2.8	0.6
1-hr. and 2-hr. Parking Signs	21.9	10.1	4.5

The distribution of time for which motorists desired to park in this city is very similar to the distribution noted in other cities. Slightly over 65 percent of the total parkers parked less than one hour, with the modal requirement about 30 minutes. Less than 23 percent of all parked vehicles remained parked for more than two hours. It would certainly be sound policy to require these 23 percent to park farther away from the business district than any other group. It is possible that this could be done with signed time limits if a great deal of expensive enforcement were used. On the other hand, the replacement of at least some of the present signs with meters would result in better voluntary enforcement, and encourage the employee parker to move to the fringe areas.

30-Minute Time Limits

In this particular city, the very center of the business district has 404 curb spaces and 529 lot spaces. The peak period demand for that area is about 1400 spaces. It would appear to be sound policy to allocate all of the curb space within this central area to parking of less than or equal to one hour's duration. Since nearly 40 percent of the parkers wish to park 20 minutes or less, an adequate portion of the spaces might be metered for very short periods of time—30 minutes or less, with perhaps a premium fee of five cents per half hour. The area surrounding this central tract of short supply has a supply of space greater than the demand; hence, those motorists destined for the central area who wish to park longer than one hour, could find space in these adjoining areas. Some of these spaces are within two blocks of the central area, and the shopper, since he will walk longer distances than the errand parker, would probably use them.

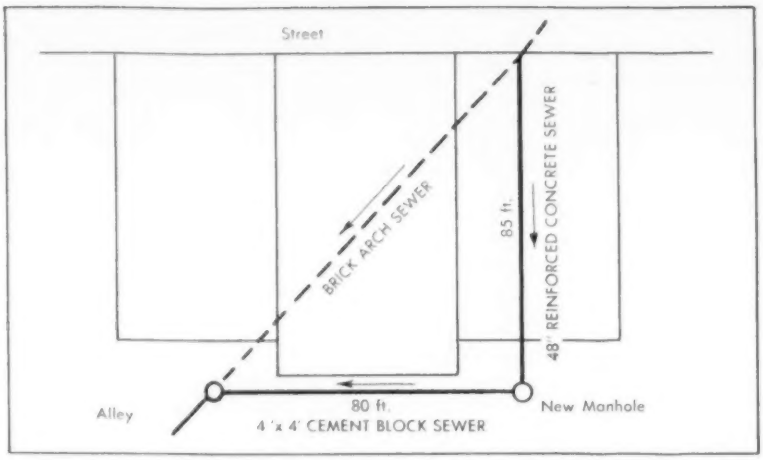
Such allocation of parking space to the errand parker also should relieve congestion in the central area, where it is most critical. The motorist looking for a space to park his car for more than an hour, would tend to avoid those areas restricted to short-time parking, for he would know that he could not find space in that area. Moreover, the errand parker would be more likely to find space, since a greater turnover would occur in the area for which he is destined. As a result, the "space-hunting", "live" parking, double parking, and other poor parking habits would be minimized, and reduction in these would promote the rapid movement of traffic and an increase in street capacity.

In summary, it may be said that even though parking meters are excellent revenue producers, they also provide a healthy and voluntary turnover of traffic; and, if properly located and enforced, they can increase the actual space available to short-time parkers in the locations where it is most desired. On the other hand, signed controls appear to be ineffective without rigid enforcement, and, in fact, may operate as no control at all. The location of parking meters can be most beneficial if located in accordance with the desires of the various classes of the parking public, and not placed merely to satisfy the financial demands of government. Moreover, the provision of parking at the curb can be allowed only as long as it does not seriously interfere with the movement of traffic. The provision of adequate off-street parking space for all classes of parkers is a requirement of every city of the near future; but for the curb spaces that we can keep, let's determine their control from facts for parking and congestion relief, not from opinion for general and parking fund money.

Cement Blocks

USED FOR SEWER RELOCATION PROJECT

FRANK L. RICE
Assistant City Engineer, Rutland, Vt.



● **LAYOUT showing relocation of sewer to avoid passing under store basement.**

BUSINESS properties are not often located immediately above large sewers, but we have had the task of replacing a sewer which formerly passed through the basement of a store with a new line which is partly located beneath the adjoining building. This project consisted of removing about 120 feet of 48" brick arch sewer from the basement of a department store and building a new sewer of reinforced concrete pipe and cement block construction. The location of these lines and details of the new construction are shown on the accompanying drawings.

The old brick arch sewer was originally laid in the bed of a small brook which ran through the business district. Marble slabs 6" thick formed the invert, while the sides were constructed of smaller pieces of various sizes grouted in place. Extensive alterations had been planned in the basement of the department store, but a survey showed that on account of the brick arch protruding up into the floor of the basement the improvements called for were impossible. Arrangements were made with the owners of the adjoining building to relocate this sewer in their basement, with provisions for suitable construction that would effectively seal out all possible odors.

It was found that by using a 48" reinforced concrete pipe for the first 85 feet the grade could be lowered enough to keep the sewer below the basement floor level. Construction on the section calling for reinforced concrete pipe was started on the upstream end of the job. Considerable difficulty was encountered in the excavation, as the sub-soil was very unstable. This portion of the City was formerly a swamp which had been filled with marble, stones, rubbish and what not. Clay and running sand were found throughout the length of the job.

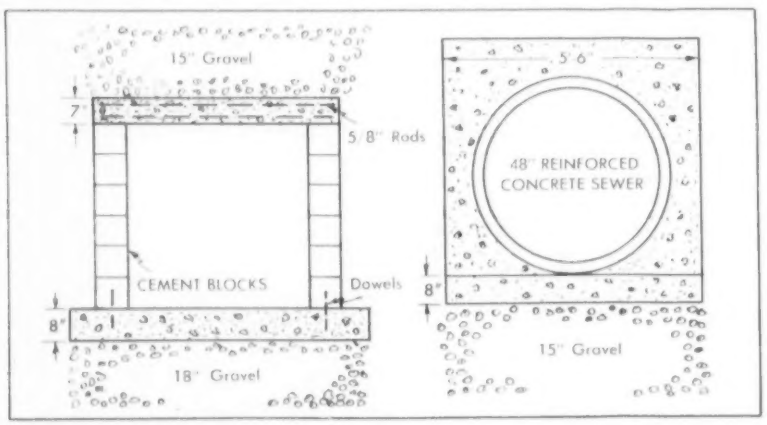
To provide a suitable foundation an 18" base of coarse gravel was tamped in the sub-grade, and an 8" footing laid on this base. The concrete pipe was then laid, starting about 2 feet from the live sewer on the upstream side. The actual tap was made later. About 40 feet of pipe was laid at a time, with joints well sealed and grouted. Forms were then placed and the pipe was completely encased in concrete to a height of 6" above the top. Where the line passed through the footing of the building, a manhole was constructed just outside the wall. This point forms the junction of pipe and cement block sewers.

The work of laying the cement blocks was begun in the usual manner. When footings were poured ⅝" dowels were left to fit into the openings in the blocks and grout was placed in these openings for the first course. When the required height was reached a 7" slab of reinforced concrete was installed for cover. Fifteen inches of gravel were placed on this slab for additional protection, as trucks would be using this area constantly.

Work was then started on the tap. Brick and stone were broken off just above the water line of live sewer, a bulkhead erected about 15 feet upstream and sewage chuted into the new sewer. The old sewer was then sealed with concrete at this junction. Forms were removed through the manhole, the bulkhead dismantled and the sewer was in operation.

Dismantling the old sewer was accomplished after a lot of hard manual labor, as no jackhammers or breakers were permitted to be used on the job.

It was thought by some skeptics that we would have trouble in the cement block sewer on account of frost, but despite the fact that this alley is clear of snow all winter, recent inspection of the sewer showed it to be in perfect condition after four years of service.



● **SECTIONS showing 48-inch round concrete sewer and 4' by 4' block sewer.**

How it Was Done:

THE DEVELOPMENT of a SMALL MUNICIPAL PARK

HAVILAND F. REVES

A STEADILY growing community confronted by the need for expanding recreational facilities, Grosse Pointe Farms, Mich., is taking full advantage of a good natural site, community experience, and popular support to develop its Pier Park. This involves a two-year development program, scheduled for completion in the fall of 1954, following approval of a half-million dollar bond issue by the amazing proportion of almost 3 to 1 on April 6, 1953 in a local election.

Pier Park was first created in 1925. A gradual process of accretion followed. The pier was rebuilt and extended, and there were additions of property on each side of the park. The park areas was gradually extended, as fill of various kinds were brought in. For two years, all city rubbish (except garbage) was dumped here, and this was covered by the excavation from the city water filtration site. The original seawall was only 80 feet from the present street line, but this process of cumulative growth extended the shore line out several hundred feet, giving about four and a half acres of park area. In its new development, the park has a width of 840 feet, while the main pier extends out 1400 feet from the entrance roadway.

Pier Park is strictly for the residents of the community which operates it. Procedure for identification is simple—in the spring of each year, each home occupant fills out a list of the members of his household who are over five years of age—and individual cards are issued for each one. As changes in occupancy occur, additional cards may be secured from the City Hall. These cards entitle the holder and his guests to use the facilities of the park, and provides a method of control which has proved very satisfactory.

The park was more than adequate for the community when it was opened. But use has increased two and a half times in the postwar years. In 1946, attendance was 59,636; in 1948 it jumped to 119,175. The peak was reached in 1951 at 149,354, while a small drop-off occurred in 1952 because of an exceptionally cold August.

Pier Park is Grosse Pointe Farms' only recreational area, excepting a ball park in the west end of town and five large school playgrounds. Physical facilities of the existing park included picnic grounds; parking space for about 200 cars; a concession building; and a children's play area. For swimming there was a 200-foot beach strip on the north side of the harbor, and a combination bathhouse and boat house which provided very limited facilities. Boating is important to many residents. There is no rental service—only boat storage for owners. Cabin cruisers have been barred for many years because of the sanitary problems created by the use of toilets on boats while in the harbor. Small open boats, largely of the outboard type, take most of the storage space today at a fee of $7.50 per year. Larger motorboats and sailboats are charged a dockage fee around $25.00.

The expansion program was a logical continuation of the experience of three decades. To present something tangible, that would give a visual presentation to the layman, a plan of the entire development was prepared by Murray W. Smith, City Engineer. This served the further important purpose of giving a basis for detailed estimates and cost planning. The 16 principal heads of the estimate, which were closely approximated in construction cost, show the scope and nature of the project:

Completing Main Pier	$56,400
Rebuilding South Pier	5,159
Improving Boat House	12,800
Bathing Pier	54,880
Bathhouse and Office	55,000
Parking Lot (445 cars)	52,120
Gatehouse and Public Toilets	7,500
Excavation and Pavement	20,000
Sidewalks and Promenades	17,500
General Lighting	25,000
Sand for Beach	12,600
Steel Sheeting	125,780
Planting and Landscaping	14,650
Mooring Facilities	10,000
Land	7,500
Engineering and Contingencies	15,000

● **ARTIST'S sketch showing proposed development and expansion of Pier Park.**

● **CONSTRUCTING south sea wall. Anchor piles are shown in foreground.**

This was a project requiring the approval of the electors, and the Council prepared a four-page brochure explaining the projected $500,000 bond issue. The proposal was to issue general obligation bonds, to be retired in 20 to 25 years. This would mean a charge of about 80 cents per $1,000 of assessed valuation. The Council made the recommendation unanimously, but decided they would make no use of tax payer's money to "sell" the idea to the voters.

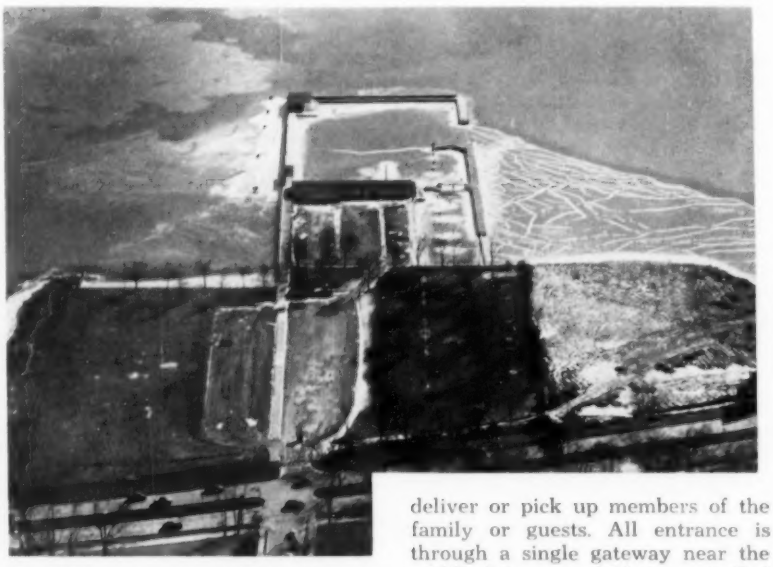
A Popular Project

The value and utility of the park to the community had been so abundantly proved in use that the project needed no organized movement to put it over by a vote of 1,701 to 737. After the election, it was felt that the experience which Mr. Smith had already had in the development and maintenance of this site should be utilized in the actual development. When his plan was ready for presentation, W. Earle Andrews of Andrews, Clark and Buckley, was called in, and approved the design, recommending no changes.

New bathing facilities capable of handling a peak load of 5,000 swimmers a day are being constructed on the new, shorter south pier. This is entirely separate from the boating area, a highly desirable separation for both types of use. This structure includes rooms for changing clothes, basket facilities including checking, and showers, quarters for the life guards, first aid rooms, and office.

The new beach is about 260 feet long, not much longer than the old, but about 400 feet deep, providing plenty of sunbathing area right on the sand, making it one of the finest beaches in the area. The new pier is 20 by 410 feet, of open wooden pile construction with steel sheeting on the south (exposed) face. Diving platforms and unusual modern swimming area facilities are included.

The south side, however, presented beach formation problems. This section had a continuously rocky shoreline, and sand never gathered there. At first, it was believed that a formed sand beach could not be held there, but a special protective plan for the beach was worked out by Ernest T. Brater, Hydrologist at the University of Michigan. This involved simply the pocketing of the beach area by construction of a steel groin on the south side, and utilization of the bathing pier itself on the north side. Both pier and groin are at elevations three feet above mean water level.



● **AERIAL view of original Pier Park prior to the new development.**

The former combination bathhouse and boathouse was remodeled and changed entirely to boat use, providing much more adequate space and some room provided for storage of park equipment.

Another innovation is the provision of a small trailer park adjacent to the boat pier. This is for the convenience of people using boat trailers and bringing equipment to or from their boats. An access roadway is provided; aside from this, vehicles are not allowed in the park area proper.

New construction includes a modern concession building, and a new gatehouse with decorative high pylon, which also serves as a sheltered waiting area. There is a new separate "tot lot", with suitable enclosure to protect the smaller children.

The parking area is entirely relocated. Lots, screened by landscape planting from both the street and the picnic area, provide spaces for about 450 cars. Limited 15-minute parking is provided in the central portion of the lot for short-time visitors—chiefly people coming to deliver or pick up members of the family or guests. All entrance is through a single gateway near the middle lot area, which is controlled by the attendant while the park is open.

An approximately even division exists, both in volume of actual work and in the cost, between marine construction on the one hand and site planning and building on the other. The marine work is being done by Dunbar and Sullivan Dredging Company of Detroit, under the direct supervision of Mr. Smith. The site planning and architectural design and construction are under O'Dell, Hewlett and Luckenbach, Architects, of Birmingham, Mich. Costs run about $250,000 for each portion.

Scheduling of work was planned to present virtually no interference with use of the park in either the 1953 or 1954 seasons by the public. The development of the south shore swimming area was carried out in the first season, while the old combination bath and boathouse was serving its original purpose. Schedules called for start of the main dock work at the end of the summer, to be completed during the winter; and for development of the north playground and picnic area as soon as possible thereafter.

HIGHWAY VACUUM CLEANER *picks up* ROADSIDE TRASH

MARK McMILLIN

THE ingenuity of the California State Highway engineers has once more been demonstrated by the construction of a cleaner developed in the shops of District VII, with headquarters at Los Angeles. Because of the unusually heavy tourist and local traffic on California highways, the State Highway Department has long been faced with the enormous problem of keeping the roadsides—particularly along the beaches and in resort areas—free of such litter as beer cans, ice-cream cups, bottles, paper plates, and other trash thrown out of cars or discarded after roadside picnics. Since only one maintenance man is available for each seven miles of road work, it is virtually impossible for the Department to keep the roadsides cleaned by hand.

Yet when engineers of District VII, P. O. Harding and W. D. Sedgwick, sought for a machine to do the road cleaning, they could find at that time none efficient enough to pick up all the various items usually discarded. A road magnet would pick up the cans, but not the bottles or papers.

Finally after a survey of available road-cleaning equipment a suction machine known as a "Leaf and Litter Collecting Unit" manufactured by the Good Roads Machinery Corporation of Minerva, Ohio, was selected as the basis for the new equipment. This machine had the necessary suction capacity as it readily sucked up bottles and cans. However, it was manufactured to pick up only leaves and paper, and all litter went through the vacuum-producing fan. All bottles, therefore, even half-gallon demijohns, were pulverized, and cans were mashed or cut up. It was obvious that the fan was not intended to stand up to the beating given it by the thousands of bottles and cans strewn along the California roadsides. Thus, District VII shop forces, under the supervision of George Siebert, were authorized to experiment with the machine in the hope that it could be adapted to pick up bottles and cans in such a way that they would not have to go through the fan.

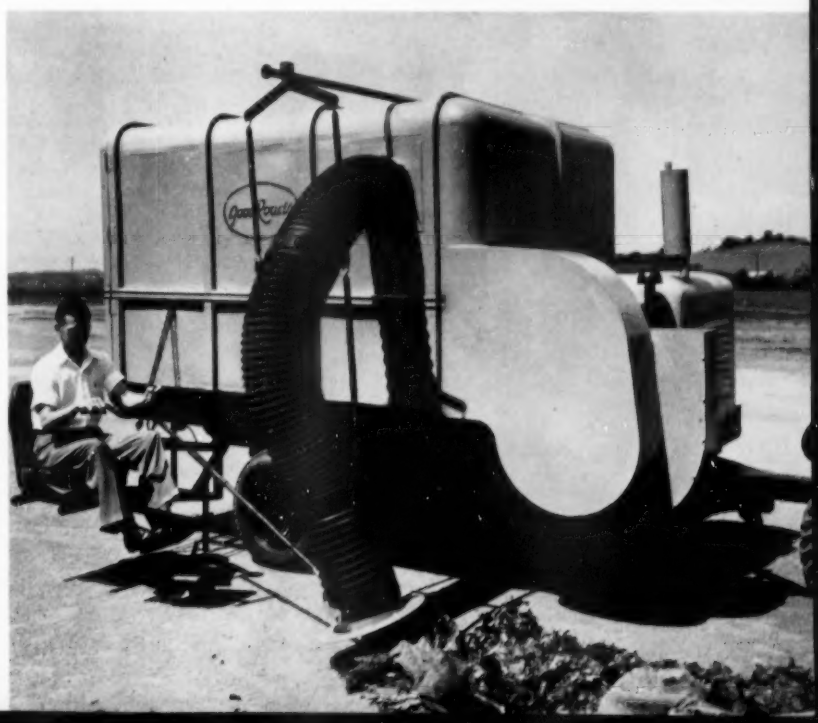
In the original adaptation, the 10-inch suction hose was attached to the upper end of a discarded hot-water tank fastened above the fan, with a 14-cubic foot rectangular box below. The velocity of the heavy articles through the water tank carried them past the fan into the box, while the paper and other light-weight litter went through the fan into the rectangular box, which serves the same purpose as the dirt bag on the household vacuum cleaner.

The adaptation worked surprisingly well, with one exception: the box was too small and required such frequent emptying at the dump as to slow down the efficiency of the machine. Even so, cost reports indicated that cleanup with this machine was far less expensive than cleaning the roads by hand. So the machine was sent back to the shop to be fitted with a large air-tight compartment.

The next try-out indicated that a sizable portion of the vacuum was lost in the hose intake so that it often failed to pick up bottles. The machine was once more sent to the shop, where the mechanics enlarged the fan and reduced friction by making all pipe connections on curves. The machine would now readily pick up any articles small enough to go through the reinforced flexible 10-inch hose.

When the improved machine was tried out, handle bars were attached to the snout and the operator walked along the machine swinging the snout back and forth. But control of the snout was not positive enough and the job proved too hard.

The mechanic then mounted a seat near the back of the box, with a footrest on which a ball was mounted. Swiveling in a socket on this ball, is a handle-bar which is attached to the intake hose near the suction end. With this handle-



● "SCAVENGER" developed by Good Roads Machinery Corp. for cleaning trash from roadsides and gutters.

● **TRASH on the roadside on Pacific Coast Highway in the Long Beach, California area.**

● **MODIFIED leaf collector on same location with operator in chair in control of collection.**

● **SAME roadside section of highway after being cleaned of trash.**

bar, the operator can sweep a five-foot strip and also control the snout elevation from the ground. The end of the hose is counterbalanced with springs, which make for easy operation. Also an electric button on the side of the box near the operator is connected with a buzzer in the cab of the truck so that the operator may signal the truck driver when something goes wrong or the hose becomes plugged.

Before the new machine goes on the job, workmen are sent ahead to rake the litter from the slopes and level areas into a windrow in the ditch. Also a man is sent ahead of the suction hose to load into a tow truck all large boxes, sticks, and other litter which might plug the hose. Thus when the machine starts operating, cleanup moves swiftly and without interruption. Incidentally, the machine is constructed so that the intake hose may be operated from either side of the box, and thus the debris can be picked up from central dividing strips without operating against traffic flow.

Within three days of being placed in operation, the machine cleaned a stretch of Malibu Beach road, taking out twelve loads or approximately 150 cubic yards of bottles, cans, and other trash. Also it has been used to pick up puncture vine, which had already gone to seed and fallen off on the Laguna Canyon Road. The only preparatory hand work necessary for this operation was to cut the main roots of the vine with a hoe.

The machine worked most efficiently in cleaning up the vines and burrs, an operation which would have been virtually impossible without the machine. Later a motion picture was made of the new machine in operation. The film has been shown at public meetings all over the state in an effort to impress the motoring public with the necessity of keeping the highways free from litter and trash. Such waste creates much additional work for the already overloaded maintenance crews.

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Mercury Vapor Street Lighting

(*Continued from page* 76)

is shut off at midnight. The whole system is turned on by a photo-electric cell, which also shuts off the "all night" lights at daybreak.

The 20,000-lumen, 400-watt mercury vapor luminaires are mounted on arms which extend six or eight feet from the poles. The arms are shaped in such a way that the luminaires are positioned approximately on a level with the top of the pole, 30 feet above the street. The six-foot overhang is used on all the business streets except La Grange Rd., where an eight-foot arm is specified. La Grange Rd. is 60 feet wide, the other streets are 42 to 48 feet wide.

On La Grange Rd., the distance from the face of the curb to the center of the pole base is 32 inches. A 26-inch setback is used for the poles on secondary business streets. The lights on La Grange Rd. are located opposite each other, and are spotted every 120 to 125 feet. On the other streets, a staggered arrangement is used in which two lights on the same side of the thoroughfare are 190 to 200 feet apart, while a pole is provided on one side of the street or the other, every 95 to 100 feet.

This arrangement produces an illumination of two footcandles on La Grange Rd., and 1.6 footcandles on all the other streets. This illumination intensity is well above the minimums prescribed by the Illuminating Engineering Society.

The GE luminaire used in the new installation is shielded 20 to 25 degrees below the horizontal. The two reflectors and one refractor that make up the optical assembly proportion the light so that a maximum amount hits the street, and a minimum amount of glare strikes the motorist's eyes.

Major intersections have a light on each corner. This arrangement produces about twice as much light at these intersections as in the middle of each block. Secondary intersections have lights on three orners. La Grange Rd. crosses the tracks of the Chicago, Burlington, and Quincy Railroad at the north end of the business district. A total of seven lights illuminate this intersection, four on the south side and three on the north side.

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A King-Sized Pot Hole

As illustrating the work done during 1953, the annual report of Hopkins, Minn., said: "Patching crews repaired pot holes and defective surfaces with enough crushed rock and patching material to fill a hole five feet deep, 20 feet wide and 100 feet long."

● RUGGED character of the watershed area of Hetch-Hetchy Reservoir is shown by this picture of Kolona Rock.

● GENERAL view of O'Shaughnessy Dam, creating the Hetch-Hetchy Reservoir, 140 miles from the city of San Francisco.

San Francisco

Plans for

WATER SUPPLY

in the YEAR 2000

DWIGHT H. BARNES

ONE of the major objectives of the City of San Francisco is to keep well ahead of its domestic water needs. While today the city has a system adequate for current requirements, it is building steadily towards a goal it established 50 years ago when San Francisco, with a population of only 350,000, set out to develop a system which would serve a metropolitan area of 4,000,000. It is anticipated this will be achieved about the year 2000.

San Francisco and suburban consumers now are using about 120 million gallons of water a day. More than half of this comes from the Tuolumne River, whose headwaters are in the Sierra Nevada Mountains nearly 200 miles from the city. The balance is from local sources which now are producing at their maximum capacity of about 50 mg.

With water consumption of the metropolitan area increasing at a rate of 1,500 million gallons a year, all of the expansion must be on the Tuolumne, the water from which is shared by the city and the rural Modesto and Turlock Irrigation Districts.

San Francisco now is constructing the third major reservoir of its remote mountain system. This is a modified earth filled structure in 4,500 foot-high Cherry Valley on the Cherry River, a major tributary of the Tuolumne. When complete some two years hence, the dam will stand 320 feet above the streambed and will be 2,700 feet across the top. A total of 270,000 acre-feet of water will be impounded behind the dam. The project was included in the original planning of the Hetch Hetchy System, as the mountain portion of San Francisco's water system is called.

Construction on the overall Hetch Hetchy project first started 40 years ago and since that time more than $115,000,000 has been expended on reservoirs, power houses and an aqueduct connecting the mountain sources with the San Francisco Peninsula. This 140 miles of pipeline and tunnel now carries 140 mgd from mountain to city entirely by gravity. Its eventual capacity will be 400 mgd.

The Cherry Valley project is being financed jointly by the city and the federal government. The United States Army Engineers will pay $9,000,000 of the estimated $14,000,000 cost with the city paying the balance. Cherry Dam will be in the unique position of being erected and operated by a metropolitan water works while in all probability none of the water impounded behind it ever will find its way into the local distribution system of the city. The new dam is being erected for two basic purposes:

(1). To meet irrigation water release commitments to the downstream Modesto and Turlock Irrigation Districts which hold prior rights in the watershed, thus freeing more water from the basic reservoir of the system, Hetch Hetchy Reservoir, for domestic consumption. (2). To store water for the manufacture of power by the city.

City officials do not intend to mix the water stored in Cherry Reservoir with that from Hetch Hetchy Reservoir, although the two lakes will be only a short distance apart. The main reason the water will be kept separate is the carefully guarded purity of that impounded in Hetch Hetchy Reservoir. It could not be duplicated in Cherry Reservoir.

San Francisco is the last big American city which still delivers into its domestic distribution system water which is pure enough to require no chemical treatment for health reasons. Actually there is "mild" chlorination just before distribution for health "insurance" and to control harmless bacteria.

The Hetch Hetchy water is pure because the reservoir is located in one of the most remote corners of Yosemite National Park and the watershed is kept in a primitive state, much the same today as it was nearly 50 years ago when Allen Hazen, noted sanitary engineer, reported to army engineers: "It would be difficult to conceive of a more

● **MOVING** *in a section of the form for the lining of the diversion tunnel.*

perfect gathering ground or one better adapted to produce water of greater purity. The water will be almost ideally safe."

Most—ninety percent—of it is 6,000 feet or more above sea level with altitudes ranging higher than 13,000 feet. The entire area is composed of granite rock, largely without soil or vegetation. Because of this, there is little or no mineral in the water when it is impounded. Chemical analyses of samples taken from Hetch Hetchy Reservoir show on the average 15 ppm of total solids and a hardness of 5 ppm as calcium carbonate. When the water arrives in San Francisco, it has a laboratory calculated hardness of only 49 ppm, compared to 275 ppm in the relatively small amounts of water still drawn from 100 old-time wells located within the city limits.

When mixed with water from all San Francisco Bay area sources of supply, the Tuolumne River water cuts the overall hardness by about half. Some enterprising mathematician figured out this reduction in hardness is saving San Francisco housewives about $511,000 a year in soap bills. The mixture of mountain and bay area water averages about 100 ppm of solids with 60 ppm hardness.

The second basic function to which Cherry Reservoir water will be put in the future, power making, is provided for in plans for erection of a power house at the confluence of the Cherry River and the Tuolumne, eight miles below the dam. An aqueduct will be so situated that a near vertical drop of 2,000 feet will give it one of the highest generating heads in the nation.

This, one other projected power plant, and the one now in operation will boost the hydroelectric power output of the entire system to 250,000 horsepower.

Other development plans call for construction of still another dam, this to be at a lower elevation. To be built in conjunction with the two irrigation districts, it will be started when the city begins taking 200,000,000 gallons a day out of the Tuolumne. This will be the new Don Pedro Dam which will provide storage for as much as 1,500,000 acre-feet of water. This $50,000,000 project will replace the main storage facilities now owned by the Modesto and Turlock Irrigation Districts. Completion of this project will mean that San Francisco can realize its goal to supply 400,000,000 gallons of water a day to a city and suburbs of 4,000,000 people.

County Road System

(*Continued from page 69*)

ranging in thickness from 1½ to 2 inches. We find that we can very often fill in a low spot on an existing road by simply increasing the thickness of the mat being laid by the finisher.

Practically all of our work is confined to County roads, of which we have some 250 miles. About 160 miles already are either of bituminuous construction or resurfaced with asphalt. While the State of Minnesota handles the maintenance on its own highways and the City of St. Paul also takes care of its own work, we have some 180 miles of village streets on which we are sometimes asked to work. Whenever we do any patching or resurfacing in these villages, they are charged our exact cost for the work done, with no profit to the county.

Since we are rapidly developing many suburban areas in Ramsey County, it follows that we are facing an increasing traffic problem, especially during the daily rush hours, morning and evening. To alleviate this problem, we have already increased some of our key roads from their original 22-ft. width, to 60 ft. so that they can carry a full four lanes of traffic; and we have another 5 miles of roads under survey with a view toward procuring right-of-way for increasing to 60-ft. widths.

In addition to our resurfacing and patching, we annually treat about 62 miles of our bituminous roads with seal coats, using MC-3 and coarse sand, about 0.2 gal. of asphalt and 10 lbs. of sand per sq. yd. We also spray about 95 miles of our gravel surfaced roads each year, using SC-2 as a dust laying oil.

1954 promises to be a busy year. In addition to our continuing program of road work, we have recently established Recreation Areas within the County and will do a considerable amount of road and parking area paving for them.

Our construction operations are under the direction of the following County officials: Harry S. Bronson, County Engineer; A. D. Crampton, Asst. Engineer; Henry G. Luecke, Supt. of Equipment; John A. Kruse, Supt. of Maintenance.

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Toll Road Makes A Profit

During the first year of operation the Oklahoma City-Tulsa Turnpike collected $2,147,003.66; with operating expenses of $547,409.54 there was a net revenue of $1,599,594.12.

Planning SEWAGE PUMPING *and* SEWER MAINTENANCE *to keep pace with* SUBURBAN GROWTH

PHIL HIRSCH

A KIND of earthquake has been rumbling through the nation ever since 1940. Americans, historically a people who are never happy in one place for very long, have been leaving the cities for the suburbs. Although the cities are nowhere near being deserted, this "rush to the suburbs" has at times taken on the proportions of a migration.

The U. S. Census bureau reports that, between 1940 and 1950, the suburban population of the United States jumped 35.6 percent, while the number of city dwellers increased only 13.9 percent. The impact of this mass exodus on municipal public works administration is nowhere more evident than in Park Forest, Ill., 30 miles south of Chicago's Loop. Here, on what was prairie land in 1945, the exodus has created a community which has grown from 8,000 to 19,000 population in the past three years, and expects to reach 30,000 by 1956.

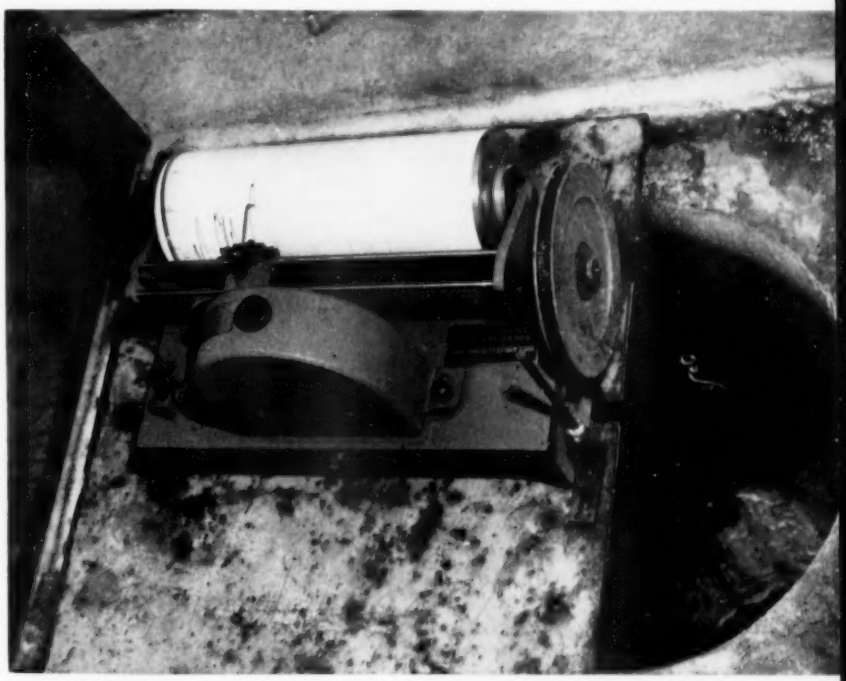
The magnet-like attraction of Park Forest for the city-dweller has created a serious drainage problem. For, even the optimistic population estimates of the village's developers, American Community Builders, proved to be too conservative for the human flood that has settled on the former prairie.

If Americans are the cleanest people on earth, one of the best examples of that cleanliness is to be found in Park Forest. Although there are no figures to prove it, the above-average income level in the village probably gives Park Foresters more than an average share of automatic washing machines, clothes dryers, and automatic dishwashers. Because almost every Park Forest family has at least one small child, the use of these gadgets, and the number of baths per household, is undoubtedly higher than in many older communities.

Keeping clean is a laudable activity, of course, but it creates drainage problems, especially when the drainage system, in addition to coping with the load from bathrooms, kitchens, and basement laundries, must accommodate the vagaries of Mother Nature as well.

Dry vs Wet Weather

In dry weather, Park Forest's sewage system is able to handle the flow from each household's plumbing system. This sewage, collected along some 30 miles of 8 to 24-in. pipe, travels by gravity to a lift station which carries it over a hill that separates Park Forest from the nearby community of Chicago Heights. A sewage disposal plant in Chicago Heights serves both communities.



● **RECORDER by Leupold & Stevens was used to measure the flow of sewage to determine design data for a pumping station to prevent sewage overflows to creek.**

When Rains Come

But in excessively wet weather, there is trouble. The excess rainwater travels through the porous ground that surrounds each foundation, and passes through drain tiles under the foundation slab into the sewage line.

The lift station, which can handle the dry-weather load only by operating at capacity, is no match for the wet-weather load. The excess sewage and rainwater flow into nearby Thorn Creek, where the sewage creates some unpleasantness between Park Forest and its neighbors.

The problem should be solved in the near future when the capacity of the lift station is increased. At present, the station handles a 525-gpm flow, using two Worthington pumps. The village plans to install two larger pumps which will be able to handle 900 gpm.

Officials arrived at the 900 gpm figure by a novel route. As Albert Heitmann, Park Forest's village engineer and director of public works,

explained: "We couldn't rely on the textbooks, because they were written before the days of automatic washers." Instead, Park Forest officials installed a Parshall Flume, fitted with a Leupold and Stevens recorder, to measure the sewage flow.

The story traced by the recorder's stylus is a graphic illustration of how a heavy rain can upset the best-conceived sewage disposal facilities. During one fairly dry week last July, for example, per capita sewage flow in Park Forest averaged 72 gallons per day. The peak load during the same week amounted to 114 gallons per person per day. In the previous month, June, 1953, Park Forest had seven inches of rainfall. The per capita peak was 138 gallons per day, compared to 114 the following month, and the per capita average was 93 gallons, compared to 72.

Cost of the installation was $5,000, but, according to Mr. Heitmann, "The flume and recorder have enabled us to obtain facts regarding the kind of lift station we need that could have been only guessed at otherwise." The $5,000 investment will continue to pay dividends after the station is built, Mr. Heitmann explained. For the recorder will continue to show sudden increases in the amount of sewage line flow, if and when they occur. This information, combined with visual checks, will help spot leaks early enough so they can be repaired with a minimum expenditure of time and money.

The amount of grease dispatched down the drain by today's superabundance of appliances is the source of another public works problem in Park Forest, and probably a good many other communities as well. It may be that you could trace the rise in American living standards since the Depression by studying the gradual increase in the amount of fatty substances clogging municipal sewage lines. For, many of the gadgets introduced in the United States since the early 30's have been cooking and washing gadgets. And the arrival of most of these appliances has been announced by increases in the amount of cooking fat and soapy water running through the pipes. In Park Forest last year, grease was particularly vicious. Between December, 1952, and September 1, 1953, 72 sewer stoppages were reported. Most of these were caused by either cooking grease or soap fat.

In October, 1953, the village purchased a flexible sewer cleaning outfit made of 5/16-in. steel rod, manufactured by the Flexible Sewer Rod Equipment Co. The rod, about 350 feet long, is coiled on a reel. On the end of the rod is an auger, about seven inches in diameter, shaped like a corkscrew. This auger is turned by a small motor which enables it to bore through any blockage.

In Park Forest, a three-man crew, which hauls the cleaning rig around in a truck, is able to finish about 1,000 feet of sewer line a day. Between October and December, 1953, when operations had to be halted because of the weather, seven miles of the initial Park Forest sewer system were cleaned. Material that had been accumulating for more than four years was removed. About three miles more of the initial system remain to be cleaned next spring. When this task is completed, the maintenance job will be substantially reduced, Mr. Heitmann believes. It will be necessary to reclean several spots along this initial ten-mile system, and to clear accumulations in some of the newer pipe sections, at least once a year.

Already, the sewer cleaning program has had results. Since October, only four sewer blockages have occurred, Park Forest's engineer reported.

One-Way Street System Experience

BUILT along both sides of the Wisconsin River, Wausau, Wisc., a city of about 30,000, has roughly half of its business, industrial and residential areas on each side of the river. Two bridges connect the principal business areas in the heart of the city. The combination of local cross-town and transient through traffic over-taxed the capacity of this bridge system. During many hours of the day it was very difficult to enter or cross the system from intersecting streets.

In 1951 a one-way system for the bridges and connecting streets was inaugurated on a trial basis. Many advantages were quickly evident. Accidents were cut in half. Time required to move through the system was reduced. Two traffic officers were relieved.

However, there were some objections. The first problem encountered was that of changing the driving habits of those who insisted in trying to drive both ways on the one-way streets. The police department estimated that it took at least 6 months to get some drivers adjusted to the new pattern and apparently a few never have. Some business houses objected, claiming loss of business. In general, however, the objections raised were hardly sufficient to justify the traffic inefficiencies of the old two-way system.

If this were the end of the story the problem might have been considered successfully solved. Unfortunately, however, some of the local citizenry noted that the bridge at the eastern end of the system, which once carried traffic both ways, now carried cars in one direction only. This, they considered, obviously meant that the bridge now was only 50 percent useful. Attempts to convince them that the volume of traffic was in fact greater were useless. At their insistence this bridge was returned to two-way traffic. This not only has reduced the effectiveness of the one-way system but it has been necessary to assign an officer to direct traffic during the peak periods. The moral is that you must not only solve your traffic problems but also you must convince a sometimes reluctant public that the changes are for the better.

These experiences been condensed from a paper presented by Archie Becher, City Engineer of Wausau, before the League of Wisconsin Municipalities Convention.

A NEW USE FOR FOAMED ASPHALT

GEO. E. MARTIN
Highway Consultant

ALMOST everyone who has had experience with heating the heavier grades of bituminous material has encountered the phenomenon of foaming. Even a small amount of water will cause the asphalt or tar to expand rapidly when heated above the boiling point of water. Until recently all efforts were devoted to preventing foaming rather than encouraging it. However, a use for the foamed material has been discovered. Briefly the paving liquid is caused to foam as it is distributed on the road so that it will penetrate to the bottom of the aggregate layer and leave an even, comparatively thin coating on the stone particles.

Several years ago a load of paving asphalt of 85 to 100 penetration was shipped to Natick, Mass., to be used on a penetration macadam job. After spreading a small portion of the load, rain occurred, thus preventing further work that day and the remainder of the load was returned, in the distributor, to the plant of the Barrett Division, Allied Chemical & Dye Corporation, at Malden, Mass. The spray bars and piping were steamed, resulting in a small amount of condensed water in the piping and spray bar. The next day this load was spread on the job.

Considerable foaming occurred during the application of the first fifty foot length treated. The customer was somewhat disturbed and to reassure him holes were dug in that section and adjoining sections where no foaming occurred. It was discovered that the asphalt had penetrated to the bottom of the stone layer in the foamed section whereas it had not done so in the regular sections. Also the stone was better coated in the foamed section.

Barrett representatives then suggested that there might be an advantage in adding water to the asphalt at some point between the tank on the distributor chassis and the spray nozzles. This was done by inserting a small nozzle into the asphalt line just before it enters the spray bar and forcing water from a small auxiliary tank by air pressure into the hot asphalt as it passes into the spray bar. The asphalt does not foam as long as it is confined under pressure in the pipe but as soon as it leaves the spray bar and is exposed to the air it does.

A small pilot plant was set up and used by Barrett engineers and technicians to determine the amount of water needed to produce the degree of foaming desired. Field experiments were also carried on to determine exactly what happens in the practical use of the method. Since that time construction projects have been successfully completed in several New England states. Additional research and experimental work is planned.

About 20 gallons of water per 1000 gallons of paving asphalt seem to give the best results. Somewhat more can be used successfully but is not needed.

In standard practice in the construction of penetration macadam the asphalt binder at the application temperature of approximately 325 degrees F. is spread on the penetration macadam stone. The asphalt coats the upper surface of the exposed aggregate, with partial coating of the remainder as it descends from the top to or toward the bot-

● **SPRAYING foamed asphalt with hand hose on penetration macadam. Note foam rising above surface in left foreground.**

● **TRUCK spraying foamed asphalt. Foam shown behind truck will settle down to the bottom and coat the stone thoroughly.**

tom of the aggregate in the penetration course. Often, too much of the binder goes to the bottom, leaving thinly coated stone close to the surface. On the other hand in cold weather an excess of asphalt binder may be left on the surface.

In the Barrett Foamed Asphalt process, the asphalt binder at the same application temperature is caused to foam vigorously, as it leaves the nozzles of the spray bars. After a brief interval, the foam subsides and usually rises at least once, slightly above the top of the penetration course. This action of the asphalt, while in the foamed state, assures a more uniform and thorough coating of all portions of the surface area of the individual aggregate exposed to the foamed asphalt. The surging action of the foamed asphalt through the voids reaches the base upon which the coarse aggregate is laid and waterproofs those portions it is able to contact.

In addition to the coating action, the addition of the water appreciably retards the set of the asphalt. This permits better consolidation of the entire penetration course by rolling. It also provides for better adhesion of the choke stone used to fill the surface voids. One other favorable result of the production of the foamed asphalt is to reduce the quantity of asphalt vapors at the spray nozzles.

This process may also be used in the distribution of hot asphalt for seal coats on penetration macadam and for surface treatments over various pavements. Due to the foaming action and to the retarded set, better consolidation and adhesion of the covering aggregate can be obtained.

The method is safe and excellent results have been obtained.

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Planning For More Highway Engineers

A "work as you learn" program which will provide selected West Virginia high school students with an engineering education has been announced by Gov. Harland of W. Va. Under the plan, students will attend one or more semesters of West Virginia University's College of Engineering each year and will work the remainder of the months with the commission in a position related to the previous semester's work. The program will be completed in five, six, seven or seven and one-half years, depending upon how much of the year is devoted to university study. Both the commission and the university recommend that the academic part be completed as rapidly as the trainee's financial condition will permit.

Upon completion of the program, the trainee will receive a bachelor of science degree in civil engineering, and will be offered a full-time position with the road commission. He will be placed in the department of his choice whenever possible.

In order to be eligible, an applicant must be a citizen of West Virginia, or a son or ward of a citizen of the state. He must also be a graduate or within six months of graduating from an educational program that will make him eligible to enter the college of engineering at the University.

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Sea Water Distillation Advances

Thermocompression distillation of sea water is remarkably efficient, but scale deposited by the boiling brine has reduced capacity and increased costs. Now the Engineer Research and Development Laboratory at Ft. Belvoir, Va., says it has found a means of controlling scale formation and also of descaling by the use of citric acid.

The descaling procedure can be accomplished while distillation is in progress and will permit indefinite maintenance of production by field units. A procedure has been devised which minimizes the corrosion hazards of the acid. It has also been established that the necessity for descaling may be greatly reduced in permanent or semi-permanent installations by using brine stabilization equipment to provide a stabilizer of suspended solids on which the greater part of the scale is deposited. In some cases, this has increased unit production greatly.

Motor Grader Works Hard in a Small Community

AT Booker, Texas, a mile-square community with a population of about 650 people, street and alley maintenance is being carried on with an AC Model D motor grader, equipped with a ⅝ cu. yd. rear-end loader.

With this unit the city is also keeping its dump "in order", has constructed 3½ miles of alleys, and is maintaining these alleys along with 13 city streets that average ½-mile in length. Surfacing material from stockpiles outside the city limits is loaded into trucks by the Model D and its loader attachment to be hauled to the scene of maintenance and repair work.

At the city dump order is maintained with the help of the grader's moldboard and the loader. Debris and rubbish brought to the dump is cleared from the center area by the grader s moldboard. Then the rear-end loader is brought into play to pile this rubbish around the outside perimeter of the area.

Another job the Model D has done for Booker is to dig all sandtraps on its nine-hole golf course, and build all bunkers on the course.

SAFER TRENCHING

by using a

TRENCH BOX

R. H. SCHNEIDER
City Engineer,
Marshfield, Wisc.

PROPER timbering of the trench is of prime consideration in the construction of a sewer in open trench. The Industrial Commission of Wisconsin Code provides that all trenches over 3 ft. in depth shall be timbered. It further provides that any trench 5 ft. to 15 ft. in depth, excavated in sand or wet soil, and all trenches over 15 ft. in depth, shall have close sheathing. Timbering is doubly important because it affects not only the safety of the men working in the trench, but also, very materially, the cost of the project. Safety must be considered during the installation and dismantling of the timbering as well as during the actual construction of the sewer within the timbering. In fact, probably the greatest hazards exist during this process of installation and dismantling.

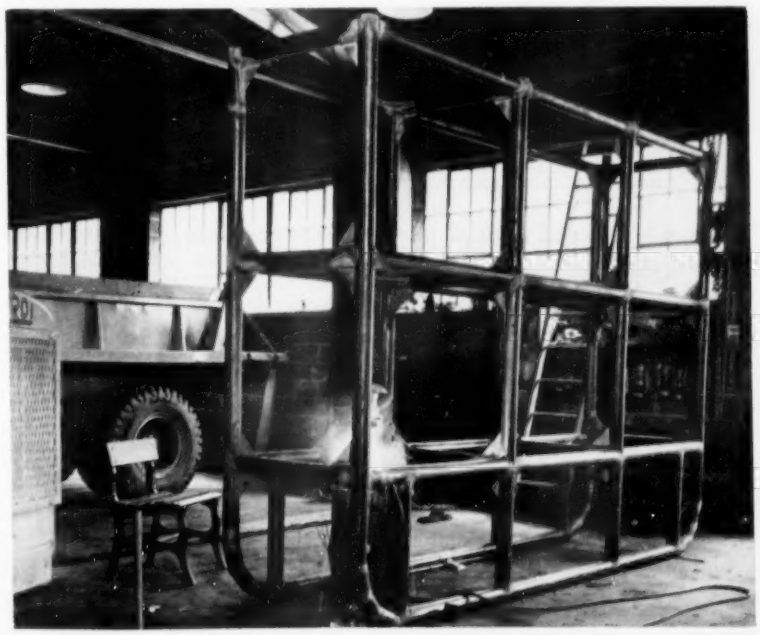
When the actual cost of the materials used in timbering is considered together with the costs induced by the time and labor spent in installing and dismantling, a sometimes sizable item is added to the cost of the project. It is unfortunate, but true, that these items of cost and the resulting delay in construction sometimes result in improper timbering that endangers those employed in the trench.

The City of Marshfield has developed a device which not only reduces the cost of timbering to an insignificant amount, but also contributes to a safer working area within the trench. This device, which we call a "trench box", has been used with a great deal of success for the past seven or eight years. Constructed in the City shops at a comparatively moderate cost, it has completely replaced timbering in sewer construction.

The box skeleton was constructed of 3-in. steel pipe with all joints welded. To increase the rigidity, ¼-in. steel gussets were welded in all planes at each joint except on the outside faces. These faces were covered with ¼-in. steel plate welded to the skeleton. The box is 12 ft. long with an inside working width of 30 ins. (our back-hoe has a 42-in. bucket). The distance from the floor of the trench to the first spreaders is approximately 28 ins. which makes it possible to lay pipe in diameters up to 18 in. Both ends of the box are rounded on the bottom to facilitate sliding when pulling the box ahead.

The box was made 9 ft. in height since our average sanitary sewer cut is 8 ft. However, detachable 3-ft. side plates can be added to the top of the box to increase the height to 12 ft. These side plates are constructed in the same manner as the box proper and slip into the open ends of the pipe on the box skeleton. The plates are secured at the top by detachable pipe spreaders. By laying heavy hardwood plank on these spreaders to form a roof, the box, with its extensions, can be used with its top below surface elevation without danger to the men working in the box. We have used the box in cuts as deep as 17 ft. However, in this case, an extra cut was taken on each side of the trench to form a ledge.

The box is hauled to the job site on a low-bed trailer. It is handled easily by a heavy chain attached to the dipper-stick on the back-hoe and to a built-in sling attached to the box. In construction, the trench is first opened up to a length approximately 1½ times the length of the box. The box is then set into the trench with the back-hoe. While the pipe layers are laying pipe and making joints in the box, the back-hoe excavates another box-length ahead. The box is then pulled ahead by the back-hoe to a new set. This operation is repeated the full length of the project, and on the average job there is little or no waiting by the pipe-layers.



● **SKELETON** of trench box made of 3-in. steel pipe. Outside faces covered with ¼-in. steel plates. Box 9 ft. high, 30 ins. wide and 12 ft. in length.

● PIPE-LAYING operation in the box in a 14-ft. cut. Pipe up to 18 inches in diameter can be handled readily.

● CAVE-INS are shown on and behind the box. On this project they occured at almost every set of the trench box.

Numerous cave-ins have been experienced on the box from one or both sides. There has been practically no deformation due to these cave-ins. There was some trouble in pulling the box out of a bad cave-in due to the pressure on the sides. However, the box was remodeled to provide a taper (it is 2 ins. narrower on the trailing end) and since then, it has been pulled easily out of the severest cave-in.

Our box has been inspected in use by representatives of our insurance company and the State Industrial Commission. Both have stated that it is equal to or better than timbering constructed in accordance with the Industrial Commission Code on trench construction. The Industrial Commission of Wisconsin Code on trench construction states that, "Any other method (than code timbering) of supporting the walls of an excavation will be approved if designed and constructed to afford equivalent protection."

The box described in this article was designed and constructed to fit our particular conditions. The principle, however, could be applied to almost any conditions. The dimensions could not only be varied; but it is conceivable that, with some ingenuity, spreaders could be designed to provide a variable width box. The user of such a method will not only realize considerable savings in trenching costs, but will be secure in the knowledge that a safer working area has been provided for the men in the trench.

Chemical Weed Control on County Highways

Most county roads, streets and a considerable portion of the grass areas in county parks were given one treatment with 2,4-D weed killer during the past year by the Wayne Co. (Mich.) Highway Department. The comparatively weed-free grass areas no longer necessitate more than one spraying a year to keep the weeds in check. Weeds from viable seed remaining in the soil will be eradicated by the next annual spraying.

Ragweed will be a perennial problem on roads within urban areas or wherever the soil is continually disturbed or contaminated. Treatment on roads where ragweed is regularly present is made early in the summer to control it and other weeds. Fortunately, ragweed succumbs easily to 2,4-D weed killer. Treatment of the ragweed fringes on out-county roads, particularly along the maintained shoulders of the roads, is simplified by use of the mobile Jeep or power wagon sprayers.

On one location, a variety of wild carrot had become somewhat resistant to 2,4-D weed killer. An application of Esteron Brush Killer instead of 2,4-D eliminated all visible signs of the weed. Experiments with Maleic Hydrazide (MH40) have been in progress. This chemical is used to retard the growth of grasses. Results of the experiments were favorable. Grass growth was definitely retarded with no apparent damage to the turf. It is believed that the use of Maleic Hydrazide around trees, structures, guard rail and other places where it is impossible to cut grass by other means than hand work will save many manhours of labor.

The total of all 2,4-D weed spraying operations last year follows: 4,498 gallons of 2,4-D were applied to 1,690 miles of roadway and 7,784 acres of road, park and other county grass areas. The average cost of spraying this acreage amounted to $4.35 per acre. This includes the cost of the 2,4-D and labor and equipment rental charges.

APWA News

AMERICAN PUBLIC WORKS ASSOCIATION
1313 EAST 60th STREET, CHICAGO 37, ILLINOIS

New Tennessee Chapter Elects Boriss as President

Organizational Meeting Held in Nashville in Conjunction With Tennessee Municipal League Launches New APWA Chapter

The organizational meeting of the Tennessee Chapter was held in Nashville, May 13-15 in conjunction with the Annual Convention of the Tennessee Municipal League. Marian E. Boriss, City Engineer of Chattanooga was elected President of the new Chapter. D. W. Allen, City Engineer of Jackson was named Vice-President while M. U. Snoderly, Engineering Consultant for the Municipal Technical Advisory Service, at Knoxville was elected Secretary-Treasurer. The excellent cooperation received from Herbert J. Bingham, Executive-Secretary of the Tennessee League helped make the inaugural meeting a big success. Warren A. Coolidge, Director of Public Works for Nashville and Southern Area Vice President of the Association presided at the opening session.

Topics discussed at the first meeting of the Chapter were the "Tennessee Stream Pollution Control Program" by R. P. Farrell, State Sanitary Engineer; "Sewage Disposal Plant Operating Problems" by W. J. Bricker, Disposal Plant Superintendent, Bristol, Tennessee and "Sewer Cleaning" by M. U. Snoderly, Engineering Consultant for the Municipal Technical Advisory Service. A motion picture showing the machine method of constructing curbs, gutters and sidewalks was also presented by Oscar Martin of the Portland Cement Association.

President
Milton Offner

Vice-Presidents
Ralph C. Graham Edward P. Decher
W. A. Coolidge Kenneth King

Past President
Allan H. Rogers

Directors
George G. Hyland Albert G. Wyler
Jean L. Vincenz Frederick Crane

Treasurer
Charles W. Darling

Executive Director
Donald F. Herrick

Quigley Named Prexy of Up-State New York Chapter

The annual meeting of the Up-State New York Chapter was held in Binghamton, New York, May 17 and 18. The members of the Up-State Chapter elected J. Leo Quigley, Commissioner of Public Works of Troy, as their new President to succeed W. J. Spellicy, Commissioner of Public Works of Binghamton. David Mann, Director of Public Works of Niagara Falls was elected Vice-President and John A. Ulinski, Commissioner of Parks, of Buffalo was named Secretary-Treasurer.

Speakers at the meeting included J. Kent Blair, Engineer of the New York State Electric Company who discussed "Street Lighting"; Grover E. Richard, Superintendent of the Water Bureau at Binghamton whose topic was "Water Supply and Purification"; Edward S. Ordway, Partner of the Consulting Engineering firm of Hazen and Emerson of New York City whose talk dealt with "Sewage Treatment" and E. E. Finn, Consulting Engineer for the Anthracite Information Bureau, New York City whose topic was "Air Pollution Control".

After reviewing the equipment display, nearly one hundred members and guests assembled for the annual banquet. The Chapter was honored by the presence of the entire Council of the City of Binghamton, headed by Mayor Donald W. Kramer. E. A. Fitzgerald, Mayor of Troy and C. B. Parkhurst, Mayor of Endicott were also present at the banquet.

Film Of The Month

A sound color film entitled "RIVER AT YOUR DOOR" is now available for general distribution. This 18 minute movie was produced by the Middlesex County Sewage Authority and is available for either 16 or 35 mm projectors. It tells the story of the once beautiful Raritan River which flows through Central New Jersey. It describes how this river became polluted and threatened the health and economic welfare of the people who live in the Raritan Valley. The film also shows how a citizen's committee was formed and a campaign launched to win public support for the only answer to the problem—construction of a trunk sewer which can return the river to its former beauty and usefulness. "RIVER AT YOUR DOOR" can be rented for $10.00 per showing or may be purchased from On Screen, Inc., Princeton, New Jersey.

Baylor to Head New Slate of Officers for Chicago

Over one hundred fifty members and guests attended the spring meeting of the Chicago Metropolitan Chapter, May 20, at the Westward Ho Country Club. C. L. Baylor, Village Engineer of Downers Grove and former Secretary-Treasurer of the Chapter was elected President to succeed Theodore Eppig, Superintendent of Sanitation for the City of Chicago. Other officers elected were: Charles V. Sramek, Ward Superintendent, Chicago, First Vice President; James F. Moring, City Engineer, Evanston, Second Vice President and A. W. Konefes, Superintendent of Equipment, Chicago, Secretary-Treasurer. The annual award for the most noteworthy achievement in the adaptation and development of municipal equipment went to the Chicago Bureau of Parking which operates under the supervision of Robert Kelly for developing a numbering device for marking parking meter posts.

Make Plans Now

. . . to attend the Annual Public Works Congress and Equipment Show to be held in Atlantic City, September 19th to 22nd.

Machine for Removing Berm from Shoulders

During the winter an earth berm is created on the shoulders of highways by an accumulation of sand and dirt. On clear shoulders the berm can be removed easily with a motor grader. But where guard rail posts or other obstructions are present the problem is more difficult. However, if not removed the berm blocks the free flow of water from the highway. In addition weeds growing on the berm are unsightly in summer and require continual hand cutting, a time consuming and expensive operation.

The removal mechanism was developed by J. J. Blaney, Equipment Inspector and Steve Choma, Garage Foreman, at the West Willington garage of the Connecticut State Highway Department. It consists of a double acting hydraulic cylinder mounted on slides which are attached to a seven foot long "H" beam. The "H" beam slides back and forth on a stationary "I" beam attached to the front end of a four wheel drive truck. The horizontal throw or movement of the "H" beam is five feet and pressure to activate the cylinder is obtained from the hydraulic system normally used for raising and lowering the wing plow atttachments.

Two mold board scraper attachments are used to remove the berm. A four foot long mold board with scraper edge is mounted at an angle with the "H" beam and is used to blade the berm material into a windrow under the guard rail cable. The next operation brings into play a five-foot mold board with scraper edge mounted at right angles to the "H" beam. This is used to cut the berm between the posts and outside the guard rail cable, and cast it down the embankment.

It takes about two minutes to remove one blade and attach the other. It is estimated that about 3,500 linear feet of berm can be removed in an eight hour working day.

• • •

Dum De Dum Dum . . .

Is the knock on the office door. I open it. There stands this young character. Burr haircut, shell rim glasses, squint, pencil, notebook . . . just like the opening of a TV show.

"I just want the facts, sir," he says.

I'm a little surprised . . . taken aback. Perhaps I show it.

"Relax" he says. "No need to worry. Just want the facts, that's all. I'm from the University. Sophomore. Course: Municipal Administration. Class: Water transportation. This is Friday. . ."

I look behind him, expecting Joe.

". . . Quiz on Monday. Subject: Concrete Pressure Pipe. Professor asks: Why good? What cost? How work? All we need are the facts. My job: get 'em!"

"Well," I say, rising to the challenge, "Price Brothers Prestressed Concrete Steel Pressure Pipe has an excellent character and I've talked to witnesses in dozens of major cities who tell me it's been on the job, without getting into the slightest trouble, ever since it came to town. Other people. . ."

"Yes sir", he says. "That's fine, sir. But no hearsay, please. Just the facts, sir."

"Right," I say, joining the act. "Steel Cylinder: water tight. Wire wrapped: great strength. Concrete core: smooth flow. Mortar encasement: long-life. Rubber and steel joints: flexible, permanent. Easy-to-lay. Easy-to-tap. Meets 'Big 3' pipe line requirements fully. . . Long Life, Sustained Capacity, Great Strength. . ."

His pencil is flying, suddenly it stops. "Look, sir," he says, "You wouldn't have this written out, would you? Something with just the facts? That would help. Sometimes I can't read my notes."

He couldn't have come at a better time. We've just finished a new 24 page booklet and catalog on Price Brothers Pipe. Hot off the press. With all the facts. I hand him one.

I have more. Plenty. You should have one. . . in your files. Then, when water-line plans begin, you'll have the facts. Up-to-date. Good idea? Fine. Send us a card. That's all, sir.

Dum de dum dum.

Harry S. Price, Jr.
Vice President

On June 4, 1954, the above letter was received in the office of PUBLIC WORKS Magazine, City of New York. Result: We asked for a copy of the booklet. You can get one too, by writing Price Brothers Company, Box 825, Dayton 1, Ohio.

Who Goes First?

Arguing about the right of way at an intersection, says the Minnesota Safety Council, is as pointless as arguing about who is going through a revolving door first. A little politeness and consideration will enable both motorists to use the intersection in safety.

HORTON STANDPIPE improves water service at Standish Corners

Deep in an orchard this 500,000-gal. Horton® welded steel standpipe is an important part of the Portland Water District water system at Standish Corners, Maine. Summer population here is many times that of Winter and adequate storage must be provided to insure efficient water service. This 35-ft. by 70-ft. high Horton standpipe is Portland Water District's answer to the sudden influx of vacationers that yearly tax its system.

Horton standpipes and reservoirs are built in standard capacities up to 10,000,000 gallons in accordance with AWWA specifications. Write our nearest office for further information, estimates or quotations. There is no obligation on your part.

HORTON
WELDED STEEL
STORAGE TANKS

CHICAGO BRIDGE & IRON COMPANY
Plants in Birmingham, Chicago, Salt Lake City, and Greenville, Pa.

Atlanta 3	2123 Healey Bldg.	Los Angeles 17	1108 General Petroleum Bldg.
Birmingham 1	1532 North Fiftieth St.	New York 6	3316-165 Broadway Bldg.
Boston 10	1038-201 Devonshire St.	Philadelphia 3	1648-1700 Walnut St. Bldg.
Chicago 4	2115 McCormick Bldg.	Pittsburgh 19	3246 Alcoa Bldg.
Cleveland 15	2221 Midland Bldg.	Salt Lake City 4	539 West 17th South St.
Detroit 26	1536 Lafayette Bldg.	San Francisco 4	1525-200 Bush St.
Havana	[illegible]	Seattle 1	1339 Henry Bldg.
Houston 2	2142 C & I Life Bldg.	Tulsa 3	1641 Hunt Bldg.

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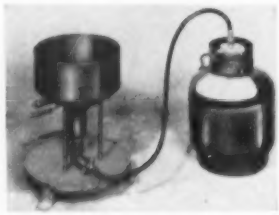
Insto-Gas

JUMBO FURNACE



FOR UTILITY CONSTRUCTION WORK

Now Insto-Gas offers JUMBO, an instant lighting furnace that will melt large quantities of lead, babbitt, zinc and compounds quickly. Only 15 minutes heating time required for 200 pounds of lead.

The broad base of the JUMBO furnace permits use on uneven or soft ground, and a convenient bail handle makes it easy to move on the job. Cast iron melting pots with pouring lips, tilting lugs and tilting hocks are available in 100 and 200 pound capacity.

When a 50 ft. connecting hose is used the JUMBO furnace can give service over a wide area without moving the cylinder. The flame control valve is located on the furnace.

INSTO-GAS TORCHES

Utility Maintenance departments use Insto-Gas torches for soldering, sweating copper pipe fittings, preheating and thawing.

INSTO-GAS EQUIPMENT IS LISTED BY BOTH UNDERWRITERS LABORATORIES AND FACTORY MUTUALS LABORATORIES.

If your distributor cannot supply Insto-Gas send for complete information.

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Insto-Gas Corporation · Detroit 7, Mich.

Washington news

Presented in cooperation with the American Public Works Association and through the courtesy of the Washington Office of the American Municipal Association.

As reported last month, a small unit within the President's Council of Economic Advisors is at work on the problem of Public Works Planning. General J. S. Bragdon is Coordinator of Public Works Planning. George H. Deming, former Director of Technical Assistance of the American Municipal Association, has been appointed as a staff assistant to General Bragdon. Foreshadowed is increased emphasis on the use of capital budgeting as a guide to public works planning.

Advance Planning of Public Works

The Housing Act of 1954, as passed by the House, contains an authorization for $10 million to be used for the advance planning of public works. The bill has been stalled in the Senate Banking & Currency Committee, during the investigation into the FHA scandals. The authorization is expected to carry in the Senate, when the bill finally comes out of committee. Under the terms of the bill, interest-free loans are authorized to municipalities to prepare a shelf of advance public works plans. The loans are repayable when the local political subdivision commences construction of the public works project. If the project is not undertaken, no repayment is necessary. Details of administering the program are expected to be much the same as those under the First and Second Advance Planning programs, which expired in 1952; when and if the authorization is backed by an actual appropriation of funds to carry out the pertinent sections of the bill.

Highway Finance Corporation Proposed

A Joint Resolution (HJRes 522) has been introduced by Congressman Steed to create a "Highway Finance Corporation." The corporation would have a capital stock of $100 million, subscribed to by the U. S., to be used in purchasing the bonds or other obligations of any state, county, city or other political subdivision issued to finance construction or reconstruction of toll-free highway facilities. Total outstanding loans would not exceed $1 billion at any one time. The bill has been referred to the House Committee on Banking & Currency.

Municipal Bonds for Selected Public Works

Senator Long (D-La) has introduced a bill, S. 3315, "The Municipal Improvements Act of 1954", for himself and thirteen other Senators (two Republicans and eleven Democrats) which would provide a Federal guarantee of municipal bonds issued by municipalities of 10,000 population or less, provided the bonds are issued for water treatment, purification or storage plants, sewerage facilities and gas distribution systems.

The legislation states: "Bonds hereafter issued by any municipality having a population of less than ten thousand inhabitants at the time of the last Federal census, for the purpose of financing a public work, when approved by the Commissioner (to be designated by the President) and endorsed by the Secretary of the Treasury as hereinafter provided, shall be fully and unconditionally guaranteed as to interest and principal by the United States".

Certain procedures are set up to satisfy the Federal official that the bonds are legal and issued for a lawful purpose. Likewise there must be presented to him a description of the project and a plan for retirement of the bonds, including the source of revenues for that purpose. The Federal official, must

"Lower the Broom" on High Sweeping Costs ...

Cleaner sweeps on all types of terrain—high-crown roads, inverted gutters, airports, freeways, etc.

Four-wheel hydraulic brakes for maximum safety. Cab protects against overhanging limbs. Greater visibility for driver.

Sweep more gutter miles per day . . . Maneuver easily around parked cars.

with

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Most For Your Money at Budget Time: Mobil-Sweeper

MANY COMMUNITIES are reporting three times the gutter miles at one-half the cost with MOBIL-SWEEPER—the *modern* machine that sweeps, sprays and carries the full load direct to the dump. Pick-up crews and expensive loading equipment are thus eliminated; more miles of streets are swept cleaner at lower cost.

MOBIL-SWEEPER MAKES STREET SWEEPING A ONE-MAN JOB. This rugged, compact machine likes "tough going"... thrives on tortuous terrain. One man sweeps deep, wide gutters, sharp curb returns, steep hills, under low-hanging trees or other obstructions with ease. Right and left gutter brooms sweep dirt, bottles, cans, other trash into the path of the big full-floating pickup broom—leaving a clean 10-ft. swath (7'3" with single broom) behind.

Then, when the 2½ cu. yd. dirt hopper is loaded, the MOBIL-SWEEPER pops off to the dump—at maximum traffic speeds. Less time is wasted "dead-heading" to and from the dump . . . more refuse is picked up and disposed of with fewer stops.

DEPENDABLE OPERATION—MAXIMUM SAFETY. Mobil-Sweeper is teamed with a modifed International Harvester chassis and the famed Silver Diamond valve-in-head engine for better performance, fewer repairs. Four-wheel hydraulic brakes protect pedestrians; a truck-style "Safety Top" cab protects the operator, gives him the visibility—and safety—he needs to do the cleaning job.

For complete information on how Mobil-Sweeper solves your sweeping problems—without creating budget problems...

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within six months after receipt of an application for Federal guarantee issue such a guarantee provided he finds that the municipality "can reasonably anticipate the revenue through the usual tax sources, special assessments, or other fees and charges to meet all interest and principal charges arising therefrom".

Municipalities would be required to pay a premium charge to "cover anticipated losses under the Act. Such charge shall be at the rate of one per centum of the total face value of the bonds guaranteed pursuant" to the Act. In addition, a "reasonable service charge to assist in defraying administrative expenses under the Act" would be levied.

Bonds issued under the plan would be "exempt, both as to principal and interest from all taxation now or hereafter imposed by the United States," or any other taxing authority. An aggregate of $200 million is allowed to be outstanding for purposes of the Act.

The large number of sponsors for this legislation makes it likely that the bill will receive some attention in this Congress, or in succeeding ones.

Federal Aid Airport Funds in Doubt

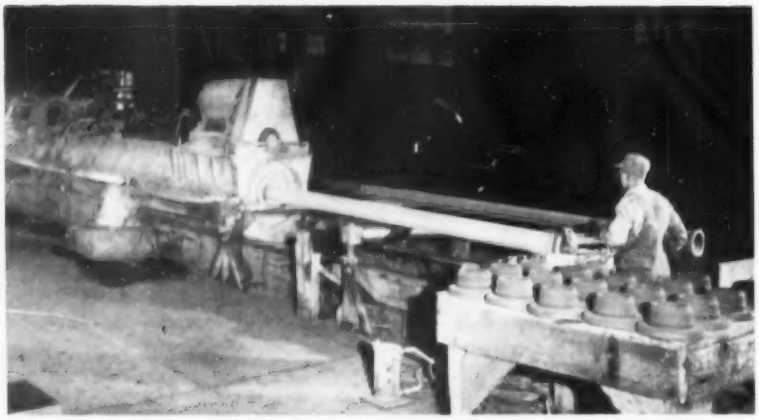
The House passed the appropriation bill for the CAA with *no* funds for Federal aid to airports. Meanwhile, the Senate Appropriations Committee has held public hearings on the matter. Testifying in favor of restoration of the funds were the American Municipal Association and several groups of airport operators and users. AMA called for a $65 million appropriation stating that the Congress should not allow the time taken out to study the Federal-aid airport program as a "penalty", against the program. Thus, AMA said, $65 million would be necessary in order to make up for the year lost by the "look-see" at the Federal Airport Program. The bill is still in committee. While it is thought that some appropriation will be recommended by the Senate Committee, probably around $32 million, it is nip-and-tuck as to whether the House will go along. Failure to appropriate funds this year, after the past year's cessation of airport construction and development program is looked upon by Washington observers as the death of the Federal Airport Program and as strangulation of the National Airport System envisioned by the 1946 Airport Act.

• • •

Value of a Continuous Construction Program

At a Senate Committee hearing on Federal appropriations for airports, Max C. Harrison, president of the Harrison Construction Co. of Pittsburgh, Pa., commented as follows: "As a representative of the construction industry, I wish to stress very strongly the fact that maximum economy in construction costs on any long-range program, whether or not it involves federal funds, is best obtained by having a continuing program. When the contracting industry knows that there will be a reasonable amount of construction work during each of several years, rather than a large volume some years and none others, contractors are in a better position to submit economical bids. Time and money are required to assemble crews for all types of construction, including airport work, and better economy results when the volume is fairly uniform."

PIG IRON *with a* HOLE IN IT!



Close-up view of pulling a pipe from centrifugal casting machine.

WHY McWANE-PACIFIC CAST IRON PIPE *LASTS for CENTURIES*

Cast Iron Pipe is an engineering product. But the "wag" who jokingly said that Cast Iron Pipe was a "chunk of pig iron with a hole in it" probably spoke with more wisdom than he realized.

Production of pig iron is the first step in refinement of iron ore. As everyone knows, iron ore has laid in the ground for untold ages of time, without rust or corrosion. The more iron is refined, the more subject it is to rust and deterioration. The less it is refined, the more durable it remains. That is why McWane-Pacific Super DeLavaud cast iron pipe, ("pig iron with a hole in it") lasts for centuries.

For details, wire or write McWANE CAST IRON PIPE COMPANY, Birmingham, Alabama, or PACIFIC STATES CAST IRON PIPE COMPANY, Provo, Utah. (Sales offices in principal cities.)

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Water Pollution Research In England

"Water Pollution Research 1953" has been published by the Department of Scientific & Industrial Research, 5-11 Regent St., SW1, London, England. The price is 65 cents. The publication includes the Reports of the Water Pollution Research Board and of the Director of Research, describing the work of the Water Pollution Research Laboratory during the year.

Effect of water treatment processes on radio isotopes—Radioactive substances are being increasingly used in hospitals and research establishments and in industry. Strict precautions have to be taken in disposing of them, because if discharged to a sewer they may pass through a sewage-disposal works and contaminate a river from which water might be drawn for domestic purposes. For this reason and also because in war time water supplies might become contaminated with radioactive materials from enemy action, the Ministry of Housing and Local Government asked for an investigation to be made to determine what would happen to such substances during the processes of treatment of water ordinarily used at a water works. The present report describes part of this investigation, particularly on the removal of radio-strontium.

Generally speaking, treatment at a water works, with the processes at present used, would not remove all radioactive isotopes likely to be present in a water contaminated as a result of an atomic explosion, though a comparatively high proportion of some isotopes would be removed. The results of this work have been considered by the Ministry which is advising water authorities on the planning of civil defense measures.

Rotation of distributors on percolating filters—Further work has been done on the relation between the efficiency of a percolating filter treating sewage and the rate of movement of the distributor from which it is applied. It seems clear that there is an optimum rate of movement for a distributor, which (for a circular filter) may be lower than that commonly found at a sewage works, when rotating distributors are driven by reaction jets. For example, in four large circular filters at Birmingham the optimum rate of rotation of the 4-armed distributors appears to be 1 revolution in 15 to 30 minutes. With this rate, the filters become much less ponded, and the quality of the final effluent is much better, than when the distributors revolve more rapidly.

One of the effects of reducing the rate of travel is usually to increase the extent of nitrification, often by a considerable amount. During one period of three months the concentration of oxidized nitrogen in the effluent from a pair of filters with distributors rotating once in 30 minutes was more than twice as great as in the effluent from a similar pair of filters on which the distributors rotated once in 1 to 5 minutes. The reasons for these differences are not known but some preliminary work is described on the movement of water and of a radioactive tracer through experimental filters. This is the beginning of a programme from which it is hoped ultimately to explain the differences found.

Surface Water—A programme of work has been begun, in collaboration with the Road Research Laboratory to study the composition of surface water from areas drained by a "separate system". A measuring flume and automatic sampling equipment have been installed on

Mobile Communication Unit Mounted In Trailer

TO provide a flexible integrated communications for its civil defense organization, Los Angeles, Calif., has added three new trailer-mounted mobile communication centers. These tie into 36 fixed communication centers throughout the city, which in turn reach 900 message centers. The trailer-mounted centers can function as bases, if necessary. They represent the combined planning of city personnel, the Fruehauf Trailer Co. and the General Electric communications department. The idea was originally conceived by Col. K. C. Bean when he was head of the City Department of Utilities and Transportation.

The new mobile units are mounted on modified 35-foot Aerovan type Fruehauf trailers with dual axles and gravity tandem suspension. They have a specially designed flat roof made to carry 300 lbs. in any concentrated area, permitting two men to work on top of the vehicle. Side windows, six on each side, coach type are provided for light and ventilation for the operating staff. There are special stanchions in addition to the regular vertical supports, to give steady support when the tractor is detached. A curbside door in addition to the regular rear door provides access.

The General Electric electrical equipment is the last word in electronic communications, and has a wide potential radio range. There are six panels, each with radio reception and transmission on independent channels. In addition, a master control ties in with other communications units including the Amateur Radio Relay League. The system includes 150 mobile two-way radio units, 100 portable walkie-talkie units, 60 medium powered radio transmitting and receiving stations in fixed locations throughout the city. Power for the mobile trailer units is provided by a 25 kilowatt Onan motor-generator set mounted on a four-wheel trailer.

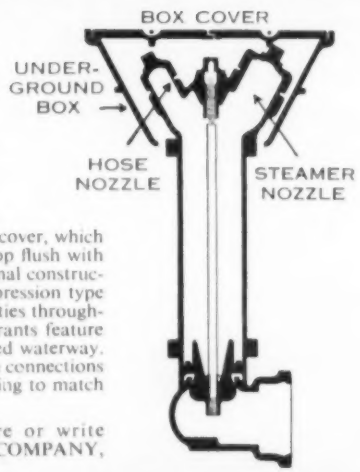
a housing estate of the London County Council and between the beginning of April and the end of August the drainage from some 50 storms was examined. Usually the concentration of suspended solids was high—sometimes exceeding 1000 ppm and rarely falling below 30 ppm. On few occasions, however, did the biochemical oxygen demand of the water exceed 20 ppm. Except at the beginning of storms, the value was usually about 7 ppm.

Treatment of cyanides on Trickling Filters—It was shown last year that although the efficiency of treatment of sewage by biological filtration is at first reduced when very small concentrations of metallic cyanides are added to the sewage, this effect soon disappears. If the amounts of cyanide added are gradually increased, concentrations of the order of 100 ppm are eventually tolerated without causing much deterioration in the quality of the effluent. It has now been found that some metallic cyanides (potassium cyanide and the complex cyanides of zinc and cadmium) can be destroyed by biological action in a percolating filter without the addition of sewage or any other nutrient. For example, when a solution containing potassium cyanide equivalent to 100 ppm HCN was treated, the concentration of HCN in the effluent did not exceed 1 ppm. With the complex cyanides of copper, nickle, and iron destruction is much less complete. It is possible that biological treatment of some types of waste water from electro-plating, and of the washing waters produced when steel is hardened by dipping in molten sodium cyanide, might be both cheaper and more convenient than the chemical methods at present used. It is hoped to carry out tests with pilot plant.

Spent liquor from gasworks—At the sewage works at Stivichall near Coventry experiments were continued on the treatment of sewage to which was added spent liquor from the gas works at Hinckley, where hot gas is treated in electrostatic detarrers. Addition of about 2.5 percent by volume of the spent liquor caused little deterioration in the quality of the sewage effluent. With ordinary spent liquor—such as that from the Leamington gas works with which experiments were carried out previously—so high a concentration would of course cause a very marked deterioration. The Hinckley liquor, however, does not contain retort-house liquor which is kept separate and is disposed of on land. When an appropriate amount of retort-house liquor was added to the spent liquor the effect of the mixture on sewage treatment was greater. Even so, the effect appears to be much less than was caused by the same proportion of mixed liquor from Leamington, where the hot gas is not treated by electrostatic precipitation.

Black Liquor from kiering of cotton—The experiments on anaerobic fermentation of "black liquor" from the kiering of cotton previously reported have been continued on a pilot plant scale. With a period of digestion of four days at 30°C. the biochemical oxygen demand of the liquor (which had previously been neutralized) was reduced by about two-thirds. The gas evolved in the process contained nearly 70 percent methane.

Effects of pollution on fish—The Laboratory is collaborating with the Ministry of Agriculture and Fisheries in a study of the effects of pollution on fish. A detailed survey is being made of conditions in an open channel carrying, with very little dilution, the effluent from the Colne Valley sewage works before it joins the River Colne. Perhaps the most striking observation made during



This M & H Hydrant sets completely underground. The cast iron box cover is on line with the ground level, thus completely eliminating any interference with traffic. M & H flush type hydrants are especially designed for use at airports servicing the heaviest modern airplanes.

The operating nut and nozzles are accessible simply by lifting the two piece cover, which has disappearing handles designed to drop flush with the cover when not in use. Hydrant internal construction is exactly the same as M & H compression type fire hydrants used by so many municipalities throughout the country. M & H flush type hydrants feature a 5¼" valve opening and an unobstructed waterway. Can be supplied with one or two fire hose connections and/or with steamer nozzle, with threading to match existing standards.

For additional information, wire or write M & H VALVE AND FITTINGS COMPANY, ANNISTON, ALABAMA.

M&H PRODUCTS FOR WATER WORKS • FILTER PLANTS INDUSTRY • SEWAGE DISPOSAL AND FIRE PROTECTION

Thousands use our Readers' Service card to keep up to date . . . do you?

HOW CLEVELAND LICKED...

ONE OF ITS *Toughest* SEWER PROBLEMS

The sewer at Edgewater Park ran right along the filled-in shore of Lake Erie. Half of the 910' line lay well below the lake level. But infiltration from Lake Erie was only part of the problem. The big danger was waste acids from nearby rayon plants . . . waste acids that had destroyed the previous line and would eat out ordinary concrete pipe almost as fast as it could be laid.

Cleveland City Engineers had specified Hamilton Kent's Tylox rubber gaskets for they knew if anything would hold out the waters of Lake Erie it would be Tylox, the rubber gasket that has earned the reputation of being "leakproof for the life of the line."

But what about the waste acids?

At the suggestion of Hamilton Kent engineers, the concrete pipe manufacturer coated the inside of the 48" sections with Rexon Pipe Coating. Rexon is a cold vulcanizing protective coating we have had under development since early 1944, and which has shown highly favorable characteristics.

Rexon penetrates deep into the pores of the concrete, sets up a tough, impermeable barrier to most acids and alkalies.

Since the line was installed in 1950, it's too early, of course, to say how long Rexon will stand up against the conditions it faces in Edgewater Park. But in similar installations the Rexon Coating appears to be unaffected after almost six years of service.

Perhaps Rexon Coating can help you solve an extra tough sewer problem. We'll be happy to talk to you about it. Write Dept. WASW 551, Hamilton Kent Manufacturing Co., 224 Gougler Street, Kent, Ohio.

Thumbnail Facts
Location: Edgewater Park, Cleveland, Ohio.
Pipe: 48" Extra Strength Reinforced Concrete made by United States Concrete Pipe Co. Interior coated with Rexon Protective Coating.
Length of Line: 910'.
Joints: Tylox rubber gaskets.
Contractor: L. A. Wells Construction Co.
Engineers: City of Cleveland, under supervision of Commissioner John C. Wenrick and Assistant Commissioner Stanley H. Murdock.
MAKING JOINTS WITH TYLOX RUBBER GASKETS IS AS SIMPLE AS ABC
Cement tongue and snap on Tylox gasket.
Lubricate sliding surfaces with Tylox Cement.
Shove the pipe home.
Write, wire, or phone for Specification Data and Literature on Tylox Gaskets.
3676
HAMILTON KENT MANUFACTURING CO.
KENT, OHIO
427 W. Grant St.
ORchard 3-9555
"THE ONLY PERMANENTLY TIGHT LINES ARE LAID WITH RUBBER JOINTS"

this survey, so far as it has gone, is that the effluent channel contains at times very large numbers of fish. During the year over 9,000 coarse fish of four species were caught. The numbers vary considerably from time to time but the changes do not seem to be correlated with changes in the chemical condition of the effluent. One result of the survey has been to emphasize how little is known about the natural movements and habits of fish in unpolluted rivers.

For comparison with the field observations, measurements of toxicity of substances likely to be present in sewage effluents are being made in the laboratory. One such substance is ammonia, the toxicity of which increases markedly with increase in pH value and with reduction in concentration of dissolved oxygen. Even when water is well oxygenated, a reduction in concentration—for example from 100 percent to 80 percent of the saturation value—causes quite a large increase in the toxic effect of ammonia, and this may well be the general effect with most other poisons. Thus, in a river which contains directly toxic substances the precise level of oxygenation may be of great importance even though the level is much higher than that which, by itself, would cause asphyxiation.

Automatic equipment—Automatic equipment has been developed to facilitate the work of various sections of the Laboratory. Apparatus devised has included automatic samplers, a submersible turbidimeter, and apparatus for automatic control of pH value.

• • •

North Carolina Center Line Painting

Traffic Engineer Robert A. Burch recently reported in No. Carolina Highways that 11,400 miles of centerlines and yellow barrier lines were painted last year on that State's highways. He emphasized that the mileage painted last year does not represent the total of painted lines in use. Many miles of roads painted in 1952 did not need repainting last year due to the use of a superior paint. Roads painted in 1953 will not require new centerlines during 1954. Rate of application on the white skip lines averaged six gallons per mile.

Last year's painting operation required 133,650 gallons of paint. About 45 per cent, or 61,000 gallons, were yellow which is used to mark barrier and "No Passing" locations. All the paint was premixed with reflectorized beads which give the centerlines greater visibility at night.

• • •

Additional Safety on the Highways

Recently the Maine Highway Department surveyed four-tenths of a mile on Route #3 in the Town of Liberty where about forty school children are being forced to walk on the pavement because of a lack of sidewalks and of width of highway. It was found at this particular location that because of vertical curves there was practically no sight distance for cars approaching children walking on the pavement. A contract has been let to reconstruct the 0.4-mile section. When completed, sight distance will be improved to allow motorists an opportunity to see the children and provisions have been made for the Town of Liberty to construct a sidewalk which will take the children off the pavement when walking to and from school.

Clow Mechanical Joint

A time-saving, easily installed mechanical joint cast iron pipe that reaches the job complete with all joint materials. Sizes 3" to 24" in 18-foot lengths.

It's always "fair weather" when you install Clow Mechanical Joint Cast Iron Pipe, Fittings and Valves. Even in a wet trench or under water, ordinary workmen can quickly do the job with ratchet wrenches. No calking needed. And once installed, this pipe line is set for a century or more of service. Each joint is sealed "bottle-tight" by a heavy molded rubber gasket—yet stays flexible to compensate for vibration, expansion or contraction. "Standardized" parts is another feature . . . glands, bolts and gaskets are completely interchangeable.

CLOW MECHANICAL JOINT CAST IRON FITTINGS

Mechanical Joint 90° Elbow

All types offered in straight and reducing sizes for use with Clow Mechanical Joint Cast Iron Pipe.

Mechanical Joint Tee

CLOW FOUNDRIES are fully equipped to produce Bell and Spigot cast iron pipe, fittings, valves and many pipe line specials.

EDDY MECHANICAL JOINT GATE VALVE

Workmen can quickly install these valves, using just a ratchet wrench to make up the joints pressure-tight. Weather is not a problem—for no calking or lead melting is necessary. Available in sizes 3" to 12" for use on both centrifugally cast and sand-cast iron pipe.

JAMES B. CLOW & SONS

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CAST IRON

and their National Cast Iron Pipe Division, Birmingham, Alabama; subsidiaries Eddy Valve Co., Waterford, New York, Iowa Valve Co., Oskaloosa, Iowa.

Now's the time to mail this month's Readers' Service card.

Problems in Constructing a Sewage Treatment Plant

THE problem of constructing the Valparaiso, Ind., sewage treatment plant began in 1948 when a court order was issued by the Indiana Stream Pollution Control Board directing the city to "cease and desist causing pollution of streams and watercourses in and about the city." This order was upheld by the Circuit Court two years later, and shortly thereafter the city employed O. M. Leonard and Associates, consulting engineers of Michigan City, to prepare a report on the construction of sewers and a sewage treatment plant. The report was submitted to the city in the fall of 1949. Finally, plans and specifications were prepared and approved by the state in 1952. The plan, as prepared, contemplated an activated sludge plant, an alternate providing for bids on both the fixed plate and the swing tube types of diffusers.

This description of construction difficulties at the Valparaiso, Ind., sewage treatment plant is condensed from a paper given at the Purdue University Road School by Prof. Charles G. Peller of Valparaiso University.

Bids for the work were opened in February, 1953. Division "A" covered the construction of a lift station and intercepting sewer. The successful bidder was the Barney Massa Construction Co., Inc., of Fort Wayne, Indiana, with a bid of $64,-843.94. Division "B" was for the treatment plant. The successful bidder was the C and C Construction Co. of Fort Wayne, Indiana, with a bid of $556,750.00.

It is interesting to note that a fairly consistent differential of $6,000 existed between the fixed plate type of air diffusion and the swing tube type of air diffusion. The City chose the swing tube type of air diffusion.

FINANCE — The project was financed through the sale of revenue bonds. The bond issue amounted to $725,000.00 and sold for 3⅜ percent in April, 1953. One point is worth mentioning and that has to do with the demand for the money received from the bonds as the construction proceeds. Having some idea of the demand for this money it is possible to invest the money in government bonds and collect 2 percent interest. The City of Valparaiso followed this procedure and earned some $4000 in interest.

CONSTRUCTION — Construction started full scale after the sale of the bonds. Ready mix concrete was used throughout, using a six-bag mix having a 3-in. to 6-in. cleanup. Some 2983 cubic yards were placed. Spud type high frequency vibrators were used to assure proper compaction and maximum density of the concrete. Curing was originally done using the flooding method. This was found unsatisfactory and an approved plastic spray coating was used for the remainder of the work. All exposed concrete surfaces were finished with a carborundum power grinder, brushed, and rubbed with a neat cement paste. Waterproofing where necessary consisted of two brush coats of iron waterproofing material.

It seems that sewage treatment plants have an affinity for the lowest and probably least desirable property in a given region. The Valparaiso treatment plant is no exception. It was constructed on a knoll of glacial gravel surrounded by a low muck area. This muck is anywhere from 24 ft. to 30 ft. deep. The major problem encountered in the erection of the treatment plant was with the construction of the lift station. Wood sheeting was first used; however, the infiltration of water was too great to pump economically. Steel sheeting was then placed around the outside of the wood sheeting. One Sunday morning in November the entire steel sheeting failed. After examination of conditions it was decided by the Engineer to move the lift station thirty feet east of the original location. The soil was removed on this new location down to the top of the water table. A header 40 ft. x 60 ft. was installed with well points 5 ft. center to center, driven to a depth of 15 ft. The bottom of the excavation came to approximately the depth of the well points. This condition was risky in that with a slight breakdown of the pumps, the excavation would immediately fill with water with a resulting cave-in of the side walls. Fortunately this did not happen and the lift station was completed.

One other problem was encountered when construction of the drop manhole at the northwest corner of the final clarifier was started. It was discovered that a triangular area about 10 feet by 14 feet along the north and west walls from the northwest corner was setting on muck. It appeared that the glacial knoll was not quite large enough for the plant. This problem was remedied by driving two sets of piles, supporting a WF section on them firmly wedged against the bottom of the clarifier. The entire unit was encased in concrete.

• • •

Truck Traveling Interval or How Do They Pass

In an effort to make big trucks less objectionable to the passenger car driver, Tennessee requires that the trucks on the highways maintain an interval of at least 300 feet between them.

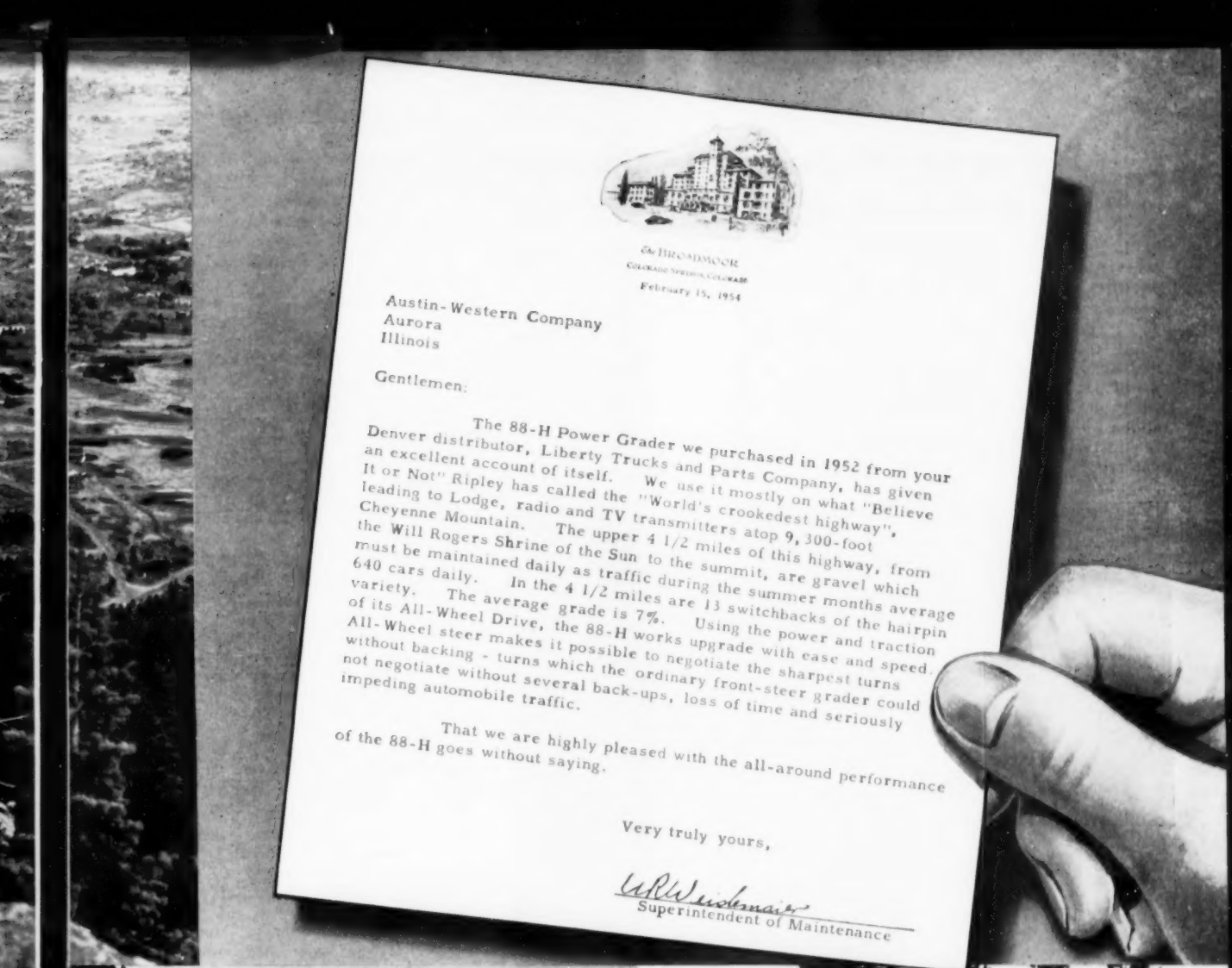
● **ONE OF** numerous new Monotube sign support installations in the Boston area. Designs offer flexibility to meet virtually any highway condition or pattern.

Lying directly at the foot of towering Cheyenne Mountain, the Broadmoor with its private golf course, lake, ice palace and rodeo stadium is one of the famous resort hotels of the world.

THE GRADER THAT GOES MOUNTAIN CLIMBING

Grades too steep and curves too sharp for the ordinary rear drive, front steer motor grader are all in a day's work for the Austin-Western Power Grader, thanks to the greatly increased traction and power-at-the-blade of its exclusive All-Wheel Drive, and to the unequalled "turnability" of its exclusive All-Wheel Steer.

To the average owner, not faced with the problem of climbing mountains, ability to *work successfully upgrade* means corresponding ability to *move more material on the level* . . . ability to negotiate mountain curves spells maneuverability that saves time on every job.



The BROADMOOR
COLORADO SPRINGS, COLORADO

February 15, 1954

Austin-Western Company
Aurora
Illinois

Gentlemen:

The 88-H Power Grader we purchased in 1952 from your Denver distributor, Liberty Trucks and Parts Company, has given an excellent account of itself. We use it mostly on what "Believe It or Not" Ripley has called the "World's crookedest highway", leading to Lodge, radio and TV transmitters atop 9,300-foot Cheyenne Mountain. The upper 4 1/2 miles of this highway, from the Will Rogers Shrine of the Sun to the summit, are gravel which must be maintained daily as traffic during the summer months average 640 cars daily. In the 4 1/2 miles are 13 switchbacks of the hairpin variety. The average grade is 7%. Using the power and traction of its All-Wheel Drive, the 88-H works upgrade with ease and speed. All-Wheel steer makes it possible to negotiate the sharpest turns without backing - turns which the ordinary front-steer grader could not negotiate without several back-ups, loss of time and seriously impeding automobile traffic.

That we are highly pleased with the all-around performance of the 88-H goes without saying.

Very truly yours,

U R Widemaier
Superintendent of Maintenance

Entering the hairpin switchback shown in the long shot at the left, the "88-H" steers front and rear wheels in opposite directions to complete *without backing* a turn that would require several time-consuming backups with a front steer grader of comparable size.

Heavy traffic on the "world's crookedest highway" makes it essential that the gravel surface be maintained in perfect condition every hour of the day. Like all Austin-Western Power Graders, the "88-H" has ample traction for work uphill as well as downhill.

Austin-Western

Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN LIMA HAMILTON BLH

Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Putting the Microscope on the Missouri Drainage Basin

CARL E. SCHWOB, Chief, Division of Water Pollution Control and GLEN J. HOPKINS, Officer in Charge, Missouri Drainage Basin Office, U. S. Public Health Service

Controlling water pollution in the Missouri River Drainage Basin will require an expenditure of $186 million by municipalities and industries in the area, according to a recent report developed cooperatively by the U. S. Public Health Service and the 10 Basin States. This comprehensive program for pollution control, a milestone in interstate and Federal-State cooperation, lists nearly 900 specific needs for sewage and industrial waste treatment plant construction. Among the 643 municipal projects recommended are 319 new sewage treatment plants, 146 replacements of existing plants, and 178 additions or enlargements. For industry, 172 new waste treatment works, 38 replacements, 26 additions and 14 enlargements—a total of 250 industrial projects—are recommended.

In the Missouri Basin, a series of cooperative sub-basin reports were prepared, presenting information on water uses; types, amounts, and resulting damages of pollutional discharges; benefits that would accrue from pollution control; pollution prevention measures in effect; and pollution control measures required. Subsequently, a coordinated and comprehensive pollution control program for the Basin, as developed by the State Water Pollution Control Agencies of the 10 Basin States, was adopted.

The Missouri is the first complete river system for which the Public Health Service has adopted a comprehensive program of pollution control as provided for in the Federal Water Pollution Control Act.

As indicating the importance of surface waters to the people of the Missouri Basin: There are 202 municipal supplies serving over 3,031,000 persons with 460 million gallons daily; 12 million acres are irrigated; nearly 2 billion gallons daily are used for industrial cooling and processing purposes; the liquid wastes of 1,073 municipalities and 332 industrial plants are removed; 25,000 to 30,000 c.f.s. for navigation are provided in the main stem of the Missouri; 4 billion kilowatt-hours of electricity are generated annually; 15 million man days are annually devoted to recreation and game fishing; thousands of pounds of commercial fish are caught annually; and water for millions of farm animals is provided.

There are 1,073 municipal sewerage systems in the Basin serving 3,955,710 persons together with 2,784,250 population equivalents of industrial wastes for a total of 6,739,960 population equivalents of organic waste tributary to municipal sewers. Treatment at 759 communities serving 70.7 percent of the sewered population provides 27.4 percent reduction in BOD to a discharged population equivalent of 4,891,650. Of the existing treatment plants, 239 have inadequate capacity and nearly 300 are not operated satisfactorily.

Industry contributes to watercourses 10,008,880 population equivalents from 332 separate sources. In addition, considerable chemical and inorganic wastes are discharged. Some degree of treatment is provided at 143 industrial establishments although treatment at 54 percent of these is inadequate.

He's Cutting Your Taxes

with PERMANENT

CAST IRON PIPE

This man is laying mechanical joint Cast Iron water pipe. For 100, 200, or even 300 years from now, it will be serving water efficiently to this municipality.

That's the record of thousands of miles of Cast Iron Pipe water mains, some of them in service in Europe when Louis XIV was King of France. Cast Iron Pipe is the No. 1 Tax Saver because it lasts for centuries!

★ ★ ★ ★ ★ ★

Woodward Iron Company does not manufacture pipe, but we supply leading Cast Iron Pipe foundries with high grade foundry pig iron from which pipe is made.

WOODWARD IRON COMPANY

WOODWARD, ALABAMA

Need more facts about advertised products? Mail your Readers' Service card now.

Save this page . . .

. . . if the

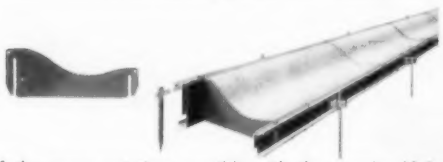
CONSTRUCTION OF

CURBS and GUTTERS

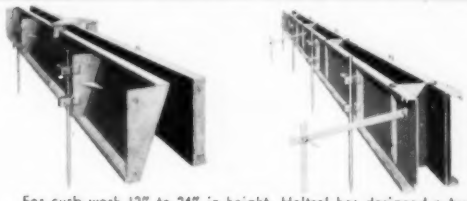
IS PART OF YOUR BUSINESS

Heltzel Curb and Gutter Forms (with multi-style face) permit contractors to meet **any** cross sectional requirement. And optional methods of supporting face allow contractors to meet **any** construction specifications.

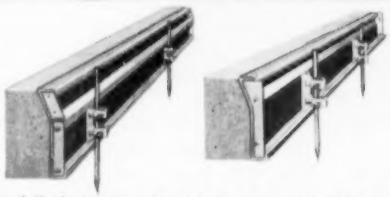
For almost 50 years Heltzel has been furnishing construction people with strong, quick-setting, fast stripping, versatile forms that make concrete forming easier, faster and less expensive.
On this page is a sampling from the world's most complete line of modern steel forms . . . designed and built by the nation's leading manufacturer of forms for concrete construction.



Two of the many variations possible with the popular **Helco Basic Forms.** These forms are designed to permit contractors to work **on almost** endless variety of curbing styles from the same basic set. All **Helco Basic Forms** are made of long lasting tough carbon manganese steel in 10' sections.



For curb work 12" to 24" in height, Heltzel has designed a **heavy duty dowel joint form** that has found ready acceptance in the field.



For partially battered curbs Heltzel can furnish either one or two piece front forms depending on your job requirements.

Heltzel builds a complete line of **Radius Forms**—either Rigid or Flexible. All forms are built to exact cross sectional specifications. Flexible Radius Forms are ideal for serpentine work for parks, etc.; Rigid Forms for repetitive curve pours where the radius is constant.

CONTRACTORS AND MUNICIPAL ENGINEERS: Today's high labor costs make the use of steel forms almost a necessity. You'll find that Heltzel can provide by far the widest variety of either standard or special forms.

If you don't already have **Heltzel Form** Bulletin L-20, get your copy today by writing The Heltzel Steel Form and Iron Company, 7400 Thomas Road, Warren, Ohio.

—Naturally It's A— Heltzel — Flor-Stone — *Product—*

Now's the time to mail this month's Readers' Service card.

Snow and Ice Control in Wayne Co., Mich.

The Winter of 1952-53 was very mild, according to the annual report of the Board of County Commissioners. Snowfall for the year was approximately 17 inches compared to the average snowfall for Wayne County of 40 inches. The Board operated 110 snow plows and 14 motor patrol graders from its various maintenance yards. A regular system of routes is followed to provide for plowing state trunk lines and county primary roads first, local roads next, and residential streets last. Due to the mildness of the winter, very little plowing was necessary and road damage due to winter elements was minor.

Various light snowfalls still created a problem, as heavy traffic immediately packs down light snow and an icy condition results. Salt is applied promptly by trucks equipped with mechanical spreaders powered off the rear wheels. Approximately 22,000 tons of salt were used during the winter. It is stockpiled in twelve strategic locations throughout Wayne County, so that distances to critical areas are as short as possible.

Snow fences, erected in November before the first snowfall and removed in the spring, are used to protect roads where experience has shown it to be advisable. They prevent roads from filling in with snow, especially where the grade line of the road is low.

• • •

Ditching for More Than 20 Miles of Sewers

LATE this summer Hendrickson Bros., contractors of Valley Stream, L. I., will complete a $2.5 million sanitary sewer job for the villages of Woodmere and Hewlett. Two Buckeye ladder type ditchers handled some 110,000 ft. of trenching for pipe 8 to 18 ins. in diameter. Ditches are 2 ft. wide and average 8 ft. deep. Some of the area was bog land, which had been filled; and under these conditions it was necessary to lay the sewer pipe on a gravel bed.

● MORE than 20 miles of sewer lines were dug on this job.

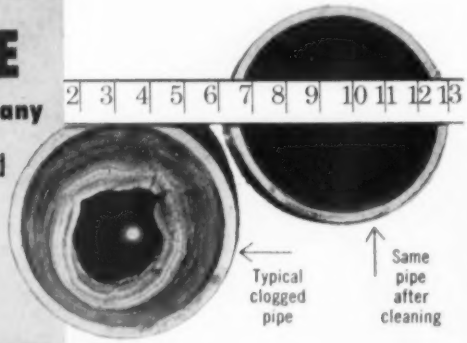
• • •

State Takes City Streets for Maintenance

The Missouri State Highway Commission has recently taken over about 40 miles of city streets marked as state highways but not legally a part of the state system. The Commission agrees to maintain the street surface so long as the street remains in the highway system. In return, the Commission gets full use of existing right of way. The city further agrees to submit for Commission approval, all traffic regulations on the street, and agrees to enact regulations approved by the Commission.

Maintenance on streets will be the same as on highways of a similar type. It does not include installing water lines, sidewalks, etc., or snow removal other than pushing snow from traveled portions of the street.

FLEXIBLE
pipe cleaning company
cleans clogged mains for about 1/30 the cost of replacement!



Guarantees 95% new main efficiency!

YOUR PROBLEM: You have a stuffed up main. You're getting less water—at higher cost.

YOUR SOLUTION: You can do one of three things:

1. You can buy bigger, more expensive pumps. However, pipewall deposit continues to build—volume again drops. Now, your pumping costs are really high!

2. You can replace the clogged main. This also is expensive. For example, 10" steel line, 30" underground, costs at least $6.00 per foot wrapped and laid, plus the cost of tees and crosses!

3. The best solution is: Get Flexible Pipe Cleaning Company to clean that clogged main! We'll restore it to 95% new efficiency! It costs you only about 18c per foot—or 1/30th of the cost of main replacement. After cleaning, you can use your present pump, too!

How much to clean your clogged mains? Send for our Preliminary Job Cost Estimate form. Take five minutes to complete this form and return it to us. We'll give you a free estimate on the cost of cleaning your pipe—stacked, stored or underground.

f-l-e-x-i-b-l-e
pipe cleaning company

Special note: We have trained personnel and special equipment to sterilize your mains.

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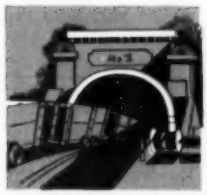
Get full details of this month's products . . . mail your Readers' Service card today.

AN INTEGRATED OPERATION FOR THE PRODUCTION OF CAST IRON PRESSURE PIPE

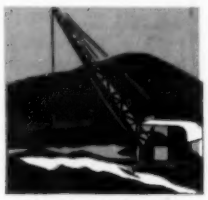


Ore and Coal Mines

Coke Ovens

Blast Furnaces

Pipe Plants



Pipe Installations

U.S. cast iron PIPE
FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

United States Pipe and Foundry Company has recently attained a goal long planned-for: complete and undivided control of every step in the production of basic raw materials that go into the making of U. S. Cast Iron Pipe.

This means ownership of *mining* operations (coal and iron ore)—*quarrying* operations (limestone)—*coking* and *blast furnace* operations—for the production of pig iron.

In addition to being able to control the quality of pipe-making raw materials at their sources, our Quality Control of pipe production gives further assurance to customers that the quality level of U. S. Cast Iron Pipe is in excess of standard specifications. Our pipe is produced to *our own* quality control specifications, more exacting than the established specifications under which cast iron pipe is normally purchased.

U. S. PIPE & FOUNDRY COMPANY
GENERAL OFFICES: BIRMINGHAM 2, ALABAMA

A wholly integrated producer . . . from mines and blast furnaces to finished pipe.

It's a fact . . . our handy Readers' Service card is the way to get new catalogs.

PUBLIC WORKS DIGESTS

THE WATER WORKS DIGEST

Zoning a 300 Sq. Mi. Distribution System

The Philadelphia Suburban Water Co. supplies water to an area of 300 sq. mi., in which the elevations vary by 600 ft. The supply is drawn from four sources and is distributed through 1586 miles of distribution mains. The elevations vary as much as 100 ft. in 600 to 700 ft. in many places, and to provide pressures everywhere within desirable limits it is necessary to zone the area. Today there are 26 distinct pressure-regulated zones serviced by 23 booster stations and 65 booster pumps having a combined capacity of 79 mgd. There are 88 pressure-regulating valves. The aim is to so limit the boundary of each zone that 50 lb. is the normal minimum working pressure. Each of the higher zones is served by an automatically controlled booster pump drawing from the zone below. Check valves permit water to flow from a higher to a lower zone in case of emergency, such as a fire; a pressure-reducing valve adjusting the charge pressure. Altitude valves also are placed at each standpipe, closing it off when full. The entire distribution system is linked by a radio system. Since 1952 the company has had its own radio transmission service—PSWC.

"Pressure-Zone Distribution for Suburban Philadelphia." By George H. Dann, Vice President. *Water Works Engineering*, May.

Views on Watershed Control

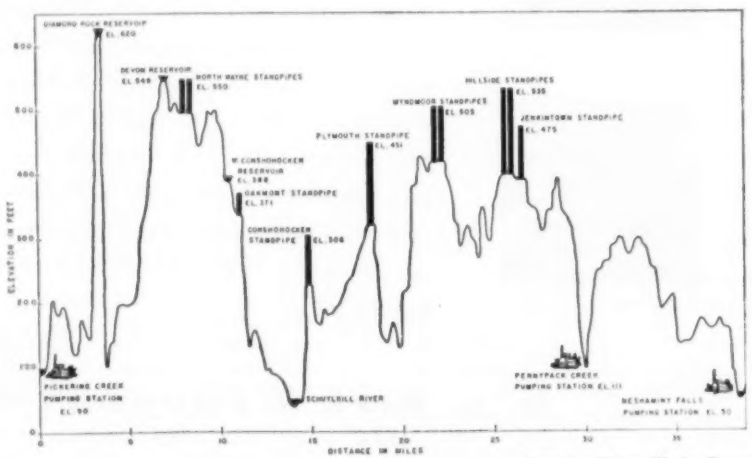
This article is a symposium contributed to by four water works engineers representing the Eastern States, the Washington Suburban Sanitary District, and two California districts, and by the Director of Fisheries of New Mexico. Edward A. Hopkins, of Baltimore, Md. says the modern trend is to rely more on treatment than on inspection of the watersheds of impounding reservoirs; but such inspection is warranted where sedimentation in large reservoirs and chlorination are the only treatment measures used. Complete treatment must be employed if the source of supply is a large river or one of the Great Lakes.

John M. Jester dealt chiefly with silt pollution of reservoirs and its decrease by soil conservation measures on watersheds. Roy E. Dodson, Jr., of California, favoring controlled recreational use of large impounding reservoirs, believed that contamination from a recreation camp is quite innocuous compared with the large volumes of sewage and industrial wastes that may reach them. But the threat of encroachment of other land uses on watersheds should be used as a lever to hasten the introduction of better treatment facilities. Gordon L. Laverty said that a rigid yardstick for all watersheds is impossible; the degree of watershed control will depend on local public sentiment, topographic and weather conditions, and the views of local engineering and health personnel, but the use should be strictly controlled. Fred A. Thompson, Director of Fisheries, thought that the benefits of recreational and other use of watersheds can be enjoyed without detriment to the water supply if there be proper water treatment methods and adequate supervision of the watershed, accompanied by proper education of sportsmen, water consumers and utility officials.

"Views on Watershed Control: A Symposium. *Journal, AWW Ass'n*, May.

Hydrologic Consideration For Designing a Reservoir

In designing the reservoir for the San Jacinto project for the supply of Houston, Tex., an exhaustive study was made to determine the probable dependable stream flow and the maximum probable spillway flood from the 2840 miles of the watershed above the proposed dam site. The consulting engineer who made this study describes in detail in this article the method of making this study. Data for the seven greatest storms recorded in that general region were analyzed and the as-


DIAMOND ROCK RESERVOIR EL. 620
DEVON RESERVOIR EL. 549
NORTH WAYNE STANDPIPES EL. 550
W. CONSHOHOCKEN RESERVOIR EL. 388
OAKMONT STANDPIPE EL. 371
CONSHOHOCKEN STANDPIPE EL. 306
PLYMOUTH STANDPIPE EL. 451
WYNNMOOR STANDPIPES EL. 503
HILLSIDE STANDPIPES EL. 535
JENKINTOWN STANDPIPE EL. 475
PICKERING CREEK PUMPING STATION EL. 90
SCHUYLKILL RIVER
PENNYPACK CREEK PUMPING STATION EL. 111
BESHAMINY FALLS PUMPING STATION EL. 50
ELEVATION IN FEET
DISTANCE IN MILES

Courtesy Water Works Engrg.

● **EAST-WEST profile of area supplied by the Philadelphia Suburban Water Co.**

sumption was made that the area of greatest precipitation of each occurred on this watershed. Allowance was made for infiltration to determine the probable runoff, and a peak of 517,000 cfs was indicated. Adding a safety factor, 525,000 cfs was used in the design. To estimate the dependable flow, the minimum rainfall rates, and the stream flow records during such dry seasons were studied; including the effect of temperature; and the relation to runoff of the season, growing or dormant. Allowance was made for evaporation and seepage losses in the reservoir (evaporation was estimated to be 55.1 in. per year), and for rainfall on it, and a minimum of 50,000 acre-feet was added for dead storage.

"Hydrologic Considerations in the San Jacinto Project." By Stifel W. Jens. *Journal, AWW Ass'n*, May.

Corrosion Inhibition By Sodium Metaphosphate

A research undertaken to determine the mechanism by which a sodium metaphosphate glass inhibited the corrosion of iron in water resulted in the conclusions that such glass, when added in sufficient quantity, will remove corrosion products from the anodes of corrosion cells. In the vicinity of such cells there is a high ferric oxide-metaphosphate ratio and a minimum pH—conditions favorable to the formation of positively charged colloidal particles of hydrous ferric oxide and metaphosphate. Some of the corrosion products stripped from the anodes are deposited on the cathodes, forming a protective film, through a process of electrodeposition. This protective film reduces the rate of corrosion by increasing the degree of polarization of the cathode. The rate of deposition of metaphosphate on cathodes is highest at a pH of 5.0, decreasing above and below that, and increased with increase in iron concentration in the water up to a limiting value.

"Mechanism of Corrosion Inhibition by Sodium Metaphosphate Glass." By James C. Lamb III and Rolf Eliassen, Mass. Inst. of Tech. *Journal, AWW Ass'n*, May.

Effects of Lime Softening

Excess lime treatment results not only in softening water but also in removal of an increased amount of magnesium and improvement in clarification, and it has a pronounced bactericidal effect—nearly 100% removal if at a pH level of 11.0 to 11.5

waterline

Construction Time Cut in Half

IN KALAMAZOO, MICH. a trench for 8″ cast iron concrete-lined pipe was being dug in soft loose soil always in danger of caving in. Pipe was being laid at only half the possible speed of trenching—so excavating was slowed accordingly to minimize the risk of cave-ins.

The City Light and Water Utilities overcame this situation by putting a Cleveland Model 80-W on the job to handle and lay pipe. The one-man-operated 80-W not only performed all the pipe installation operations fast enough to permit full-time trenching but also performed the additional backfilling required by this job speed-up. Net result: construction time for the entire project was cut in half.

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and 4 hr. contact time. Several cities have successfully employed lime for disinfecting distribution mains; at Oklahoma City by 48 hr. incubation with water with a pH of 12.4.

Bronze containing more than 6% zinc is detrimentally affected by water with a pH of 10.0 or more (Grade 1 bronze, ASTM specifications, contains only 4% zinc, but has low tensile strength).

"Effects of Lime Softening." By Merrill L. Riehl, Supt. of Water Purif., Youngstown, O.; Herbert O. Hartung, Supt., St. Louis County Water Co.; and Frank S. Taylor, Asst. Supt., Water Dept., Oklahoma City. *Journal, AWW Ass'n*, May .

Large Tank Prestressed By a New System

What may be the largest prestressed tank ever built—200 ft. diameter and 43 ft. 8 in. wall height—is under construction in Richmond, Calif. by the East Bay Municipal Utility District. This district already has 30 prestressed tanks, but the method of prestressing used in this one differs from any used before. Instead of wires for prestressing, cables are used for both horizontal and vertical stressing, the former sheathed in flexible metal tubing, the latter in smooth light-gauge pipes, all cast within the concrete wall. Pilasters are spaced 45° apart around the tank. Each cable spans 90° of the tank's circumference, and the ends of the four cables are anchored in four of the eight pilasters, the ends of the next cables above and below being anchored in the other four. The ends of the four cables in each band are connected by a device for stressing the cables by jacking, which will be done after all concrete has been poured, all four jacks in each band being stressed at the same time and with the same stress.

"New Prestress Method for Biggest Water Tank." *Engineering News-Record*, May 20.

Old Reservoirs Used as Desilting Basins

Campbellsville, Ky., population 5,500, to meet the demands of increasing population, is constructing a 300 mg reservoir on a creek on which two smaller reservoirs had been built previously. It is located about one-half mile down stream from the last dam, an advantage of this location being that the two previous dams would provide desilting basins. Silting had been a problem with the old dams, and it is hoped that this use of them, combined with conservation measures on the 8.4 sq. mi. watershed, will prolong indefinitely the useful life of the new reservoir.

A new treatment plant is to be built in a new location. The old plant will be flooded by the new reservoir, which fact presents the problem of putting the new plant into service before the old plant is put out of service by flooding. U. S. Highway No. 68 will be flooded by the new reservoir and is relocated by carrying it across the dam. This is really a better location, because of which the Kentucky Dept. of Highways is sharing in the cost of the dam and the bridge over the spillway.

"Modern Water Supply and Treatment for a Small City." By James W. Bowman, Design Engineer. *PUBLIC WORKS*, June.

Water Main Extension in Honolulu

The city of Honolulu, Hawaii is using with success and general approval a plan for financing extensions of service for new subdivisions. The water board is required to be wholly self-supporting, and requires

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Sell More

In a little office under the stairs, in the Board of Directors suite, in the showrooms, at the counters, behind the desks and at the long meeting tables, men ponder a common objective—sell more.

Sell more—but where? Not where the demand is already created but where sales barriers must be broken. Not just where they are "buying", but where constructive sales effort can exact its reward —orders. Not just where everyone sells. Not just the beaten paths behind others and before only a few, but where volume goes unrecognized. Not where it's easiest, but where it takes drive and real sales ability.

Sell more—but how? Not with just the same old "canned" story, but with new approaches and eye-opening techniques featuring fresh material. Not with the parry and run style, but with the well planned and executed sales presentation that encourages discussion and decisions. Not with the eager hand and weak voice, but with a sound specific appraisal, a proposal and a straightforward request for dotted line action. Not with order "taking", but with order "ASKING".

Sell more—but when? Not when the products of mass production are piled high, but when they reach the end of the production line. Not just when an account is "ripe", but when they have an application for the product. Not when it's convenient, but constantly. Not just when those to whom we are responsible say "sell", but endlessly.

Some sulk. Some panic. Some sleep—and some SELL!

Those who sulk are determined to find gloom, not gold. It's a pastime replacing realism.

Nor does panic produce the profitable distribution of a product.

Those who let sleep supplant aggressive selling, will be shuttled to a side track to watch success unlimited pass them by.

But to those who plan and act with enthusiasm for the challenge, that is selling. Those who sell with their hearts as well as their minds and hands, will know success intimately. In a measure, they will know failure too, for around them they will always find some who sulk, the panic stricken and those asleep; trying only to sell sad philosophy. They will be known by their sales records.

As the creed "Sell More" goes across the country, men must recognize in each other the attitude and ability in portions equal to the task—it will then be accomplished even better than before!

It's up to each of us.

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each subdivision developer to pay the entire cost of the distribution system within his subdivision. Financing the extension of supply mains to the subdivision is now effected under a plan which is considered fair to both developer and city. This, called the "Seventy Percent Refund Plan" provides that the developer furnish all *materials* for the main extension. The cost of this is eligible for refund, and the water board agrees to refund to the developer 70% of the gross water revenue derived from new services along the main extension and all new service connections within the subdivision; this agreement to terminate at the end of five years or as soon as the developer has been refunded 100% of his investment in the main extension.

"Workable Water Main Extension Plan Adopted by Honolulu." By Francis I. Fujita, Asst. Mgr. of Sales Div. *Water Works Engineering*, May.

Desalting Sea Water

The Interior Dept., after two years of research, believes that it is possible to produce fresh water from sea water for industrial use at costs competitive with what some companies now pay to develop fresh water sources. Some processes may be practicable for municipalities. The membrane process may produce irrigation water from brackish water. Six processes are named as looking most promising; seven others are under investigation. The six most promising are: Vapor compression distillation, possibly costing 30 to 40 cents per thousand gallons; electric membrane; an electric current moves the minerals through plastic membranes; solar evaporation; thermal differential; high temperature pressure: 700° F and 3,200 psi; and multiple effect evaporation.

The seven other possibilities are: Freezing, osmotic membrane, molecular oil films, solvent extraction, thermo-osmosis, and electrogravitation.

"Seawater Desalted Six Ways." *Engineering News-Record*, May 6.

Planning 250 mgd Additional Water for Houston

The San Jacinto River Authority has prepared a master plan for supplying Houston and Baytown, Tex., with an additional minimum yield of 250 mgd from San Jacinto watershed. The plan also includes flood control. The watershed's annual runoff averages 456 billion gallons. It is practicable to conserve at least half of this by building ten dams costing $10 million. The water is clean enough for use in many industries without treatment and can be treated at moderate cost for domestic use.

"More Water for Fast Growing Houston?" *Engineering News-Record*, April 1.

Removing Radio-Isotopes From Domestic Water Supplies

The Dept. of Scientific and Industrial Research, England, has conducted an investigation into the extent to which radioactive isotopes in water would be removed by regular plant treatment using coagulants and slow sand filters. Chief attention was given to radio-strontium, one of the most dangerous possible contaminants of water supplies. It was found that treatment with coagulant in the quantities ordinarily used did not remove more than 5% of the initial activity due to strontium. By softening the water with calcium hydroxide followed by sodium carbonate, 60 to 75% of the active strontium was removed. When softening with $CaCO_3$, the proportion of radio-strontium re-

1. Large illustration shows Singl-use Fiberform ready to be filled.
2. Filling plate and collar simplify pouring concrete into form.
3. Completed meter box barrel.
4. Meter box with cover in place.

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moved increased directly as the proportion of hardness removed, to a maximum of about 80%. When softening by the base exchange process, 97 to 99% was removed.

Slow sand filters removed almost all the radio-strontium at first, the proportion decreasing rapidly for 14 days to zero removal. Most of the strontium removed was retained in the detritus and organic film at the surface of the filter and was readily removed by normal washing.

"Removal of Radio-Isotopes from Domestic Water Supplies." *The Surveyor,* April 14.

Water Storage In Natural Lakes

Orlando, Fla., has a population approaching 67,000 permanent and a much larger winter population. The peak consumption in 1953 was 20,700,000 gal. in June—a dry month—while the minimum was about 6,000,000. The supply is obtained from four wells 300 to 1100 ft. deep with a capacity of 16,000,000 gpd. Additional wells are to be sunk. The water is filtered and chlorinated in a plant with a capacity of 16 mgd, to be increased to 24 mgd.

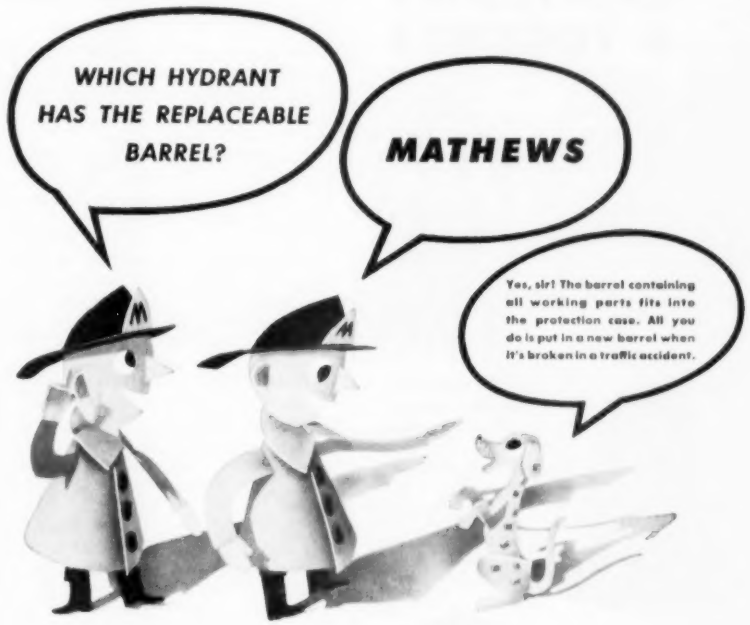
There are 42 lakes within the environs of Orlando, and five of these, situated near the water pumping and treatment plant, are used for raw water storage. A set level is maintained in these within 6 in. by the use of flood gates. With the increasing demand for water, this finished water storage is not going to be enough and will be supplemented by construction of a 2,000,000-gal. reinforced concrete reservoir of standard design for remote control storage, and a pumping station, which will pump finished water back into the mains. There will also be three new overhead storage tanks for finished water, two of 500,000 gals. each and one of 1,000,000 gals.

"Meeting Water Needs in a Fast Growing City." By C. E. Wright. *PUBLIC WORKS,* June.

Water Rate Schedules

The Committee on Water Rates of the AWWA, in a report this year, states that a simple set of rules for fixing water rates that would apply to all cases is impossible of formulation, because of differences in local conditions, laws, ownership, control and others. Their report outlines the basic elements involved and suggests alternate rules of procedure for formulating rates. Four bases for rate structures are discussed: 1—*A demand* basis for normal users, including a service charge for each size of meter and commodity rates in three steps. The service charges are to include all commercial expenses, all costs chargeable to meters and services, and a demand charge equal to 50% of the fixed costs. All special uses are to be charged separately to customers. 2—*A functional cost* basis for normal users, differing from the demand basis only in that all fixed charges are included in the commodity rates; minimum bills are based on the sum of the service charge plus the use of 9,000 gal. per quarter for each equivalent ⅝-in. meter. 3—*Commodity rates only,* without a service charge, but substituting a suitable minimum charge, and with all special uses charged separately to customers. 4—*Commodity rates only,* without a service charge with a minimum charge sufficient to provide all the costs of special uses.

"Determination of Water Rate Schedules." Committee report. *Journal, American Water Works Ass'n,* March.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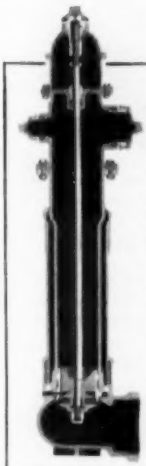

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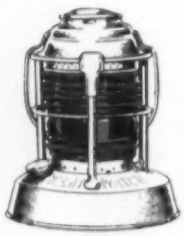

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Other Articles

"Modern Water Rates" in 10 cities. American City, May.

Repairing a leaking reservoir by stabilization of the soil under the cracked concrete lining. "Soil Stabilization Saves 40-Year Old Reservoir." By William B. Johnson, water supt., and John O. Fulmer, Jr., chemist, Easton, Pa. American City, May.

"Ozone for Water Treatment, Production and Use of". By Edward W. Lingel, PUBLIC WORKS, June.

"Seattle Gravity Supply Meets Metropolitan Growth Needs." By Roy W. Morse, Supt. Water Works Engineering, May.

"Oklahoma City System Expanded to Meet Population Growth." By Morrison B. Cunningham, Supt. Water Works Engineering, May.

"Des Moines Has Maintained Safety Factor in Its Supply." By Dale L. Maffitt, Gen'l Mgr. Water Works Engineering, May.

Conservation of water resources. "Need for Water Resources Conservation in Texas." By A. P. Rollins, State Board of Water Engrs. Journal, AWW Ass'n, May.

"Water Resources Development in Texas, Legal Aspects of." By Victor W. Bouldin. Journal, AWW Ass'n, May.

"San Jacinto Water Supply[1] for Houston." (See Water Works Digests for June). By F. N. Baldwin, Director Utilities Dept. and seven other officials and engineers connected with the project. Journal, AWW Ass'n. May.

"Ion Exchange Methods in Water Analysis, Use of." By Calvin Calmon, The Permutit Co. Journal, AWW Ass'n, May.

Lauryl Sulfate Tryptose Broth as a Presumptive and Confirmatory Medium for Coliform Organisms." By Alice K. Bicknell, John Middleton and Thomas Neblett, Wayne Univ. Journal, AWW Ass'n, May.

Noxious actinomycetes, believed to be responsible for many tastes and odors, can be isolated by techniques described by the author in "Newer Concepts of Tastes and Odors in Surface Water Supplies." By J. K. G. Silvey, Biology Dept., North Texas State College. Water & Sewage Works, May.

"Office Operation. Water Utility." By James M. Symons, student at Cornell Univ. Water & Sewage Works, May.

"House Service Lines, Should We Own and Maintain?" Arguments in the affirmative. By Arthur P. Kuranz, Mgr. Waukesha, Wis. Water & Sewage Works, May.

Improving Pipe Lines Over a Bridge

Last spring one of the two 10-in. cast iron mains on the lower bridge across the Kennebec River began to show its age of 67 years. This pipe was suspended under the south sidewalk in lengths shorter than its support spans so that traffic vibration caused it to settle unevenly and leak at several points. The State Highway Commission had previously rebuilt the sidewalk with steel supports and treated wood planking. We replaced the south side pipe promptly with 10-in. cement lined pipe in lengths matching the span of the sidewalk supports, anchored it securely with strap iron and insulated it with glass fiber and aluminum foil to prevent freezing. It was necessary to make rather extensive changes in piping at the corners of Front Street and Bowman Street where they meet the bridge roadway. Late in the fall the State Bridge Department started rebuilding the Northerly sidewalk and we followed along with similar replacement of the 10-in. main on that side which was installed in 1908. No work was necessary here beyond the bridge abutments.—The 1953 report of the Augusta, Me., Water Dist., S. S. Anthony, Supt. and Engineer.

• • •

New Federal Aid Highway Bill

The largest Federal Aid authorization ever enacted has become a law. The authorization is for two fiscal years and is as follows:

Annual Authorization	
Primary System	$315,000,000
Secondary System	210,000,000
Urban Areas	175,000,000
Interstate System	175,000,000

This is the regular Federal Aid which will be distributed to the states on the usual basis of area, mileage and population. States will match the Federal money on a 50-50 basis.

On the Interstate System 50 percent of the money will be divided on the basis of population alone with the remainder distributed according to the usual Federal Aid formula. The Federal matching share will be 60 percent. States are permitted to transfer up to ten percent of the specific authorization for the Primary, Secondary or Urban systems to one or both of the other two.

In addition the bill carries $81,000,000 per year for forest, park and similar roads to be expended by the Bureau of Public Roads.

PUBLIC WORKS DIGESTS

THE SEWERAGE AND REFUSE DIGEST

Treating Chemical Wastes of an English Plant

The Monsanto Co. operates a plant the wastes of which discharge into the river Dee, England. The plant produces synthetic phenol, salicylic acid, aspirin and other organic chemicals. While it was small, the effluents were discharged into lagoons, but as it increased greatly in output some method of treatment became necessary. Impressed by the success of the plants of the Dow Chemical Co. in the United States, the methods of that company were studied in the laboratory, using a small percolating filter having ⅜ to ¾-in. broken stone as a medium. This gave a 92% removal of equivalent phenol with a loading of 0.33 lb./yd./day. Then a pilot plant was built using 2.5-in. slag as the medium; but this was only about one-fourth as efficient. "Subsequent experience with laboratory filters has shown that the purification rates obtainable with this type of influent are almost invariably higher than those given by full-scale plants with coarser media." A full-size plant was built using 1.5 to 2.5-in. slag for the filter, which received effluent from a clarifier that gave 3-hr. detention, which effluent was diluted with filter effluent. A larger plant is now under construction in which the filter medium is 1.75 to 2.5-in. granite. Four filters will have a capacity of 1,920,000 gpd each. The new plant will have balancing tanks giving 2.5 hr. retention, storage tanks for strong and weak liquors, and mixing chambers for mixing strong, weak and recirculated liquors; lime mixing equipment (to maintain a pH of 6.8); primary and final clarifiers and sludge drying beds. There is no sewage in the wastes treated and ten months' operation was required for the development of species or strains of bacteria capable of utilizing these chemical wastes. Later, an arrangement was made with a neighboring sewage plant to pump settled sewage to this plant to provide nutrient. This sewage averages 98 ppm total nitrogen, and the quantity used is about 2% of the chemical wastes. The use of this sewage began in February 1954 and no data as to the result of this procedure were given.

"Treatment of Chemical Wastes." *The Surveyor* (England), April 17 and April 24.

Sludge Concentration At Beaumont, Texas

Beaumont, Tex., is building the first new sewage works designed to use sludge concentration as devised by Wilbur Torpey. It is a 30 mgd, two-stage, high-rate trickling filter plant, with two digesters whose combined capacity is only 45% of that ordinarily provided. This process thickens a mixture of primary and high-rate activated sludge in a proportion controlled by a time clock. The mixer used for thickening is the Dorr "Densludge" thickener. The primary digester will be heated by an external heat exchanger. The digester gas will not be used, as the very low electric power rate there makes this uneconomical. It is expected to thicken the sludge to 7.5% to 9.0% dry solids, and dry it on open-air beds. The method of contracting the works was unusual. Before the final construction drawings had been started, contracts were let for all the major items of plant equipment, to be delivered not less than nine months later; the contracts to be transferred to the contractor who would be awarded the lump-sum contract for the entire plant. The bid accepted was $2,387,000.

"Thick Sludge Saves Dollars." *Engineering News-Record*, April 29.

PLASTIC pipe was used for a lawn sprinkling system for the Paramount School near Los Angeles, Calif. The installation required 8 miles of Kraloy pipe and the cost of the job was less than $23,000. The photo shows installation under way.

Treating Cellulose Acetate Wastes

During the past three years, more than 35 million lb. of acetate wastes have been produced in the United States. Most of the wastes from the manufacturing of this contain small amounts of unrecoverable acetic acid, cellulose acetate fines, acetate, and sugars from hydrolysis. The Celanese Corp. of America has conducted an investigation of methods for treating these wastes. Using anaerobic digestion, they found it too costly; an 80% of reduction of BOD could be obtained, applying 0.023 lb. of BOD per cu. ft. Using a high-rate trickling filter with a recycle ratio of 3:1, an overall efficiency of 93.0% was obtained when applying 1.6 lb. of BOD per cu. yd.

"Experimental Filters for Treating Cellulose Acetate Wastes Yield Encouraging Results." By L. W. Roznoy, Celanese Corp. of America. *Civil Engineering*, May.

Scum Control by Gas Circulation

The District of Columbia sewage treatment plant's operating staff, after trying practically all physical methods known for controlling the scum on its twelve digesters, finally developed a method that "stood every test of time and application that could be devised." It consists essentially of injecting sludge gas into the digester below the scum layer at a rate that brings about the disintegration of the scum. When applied to a new tank, the formation of a dense scum cap is prevented. Applied to a tank with a heavy scum cap, the cap is dispersed and its reformation is prevented. The method has seen regular service in the digesters of the District for several years, and has recently been installed at Tulsa, Okla. In 1953, controlled tests were made in a new tank recently installed in the District plant to obtain data as to what took place during such treatment.

um had already collected to a depth of 9.5 cu. ft. Then gas was applied at a rate of 140 cfm. Gas production of the tank increased from 9.5 cu. ft. per pound of volatile solids added to 14.0 cu. ft. In 13 days the thickness of the scum cap was reduced to 4 ft. and the solids in the scum was reduced 66%. After another 14 days, no scum cap could be measured. It apparently has been demonstrated that employment of gas circulation will give positive and economical control of the scum normally present in sludge digestion tanks, and will allow appreciable increase in tank loadings to at least 0.12 to 0.15 lb. of volatile solids per cu. ft. per day in modern heated tanks.

"Scum Control in Sludge Digestion." By Ralph E. Fuhrman, Deputy Director, Dept. of San. Eng. *Sewage and Industrial Wastes*, April.

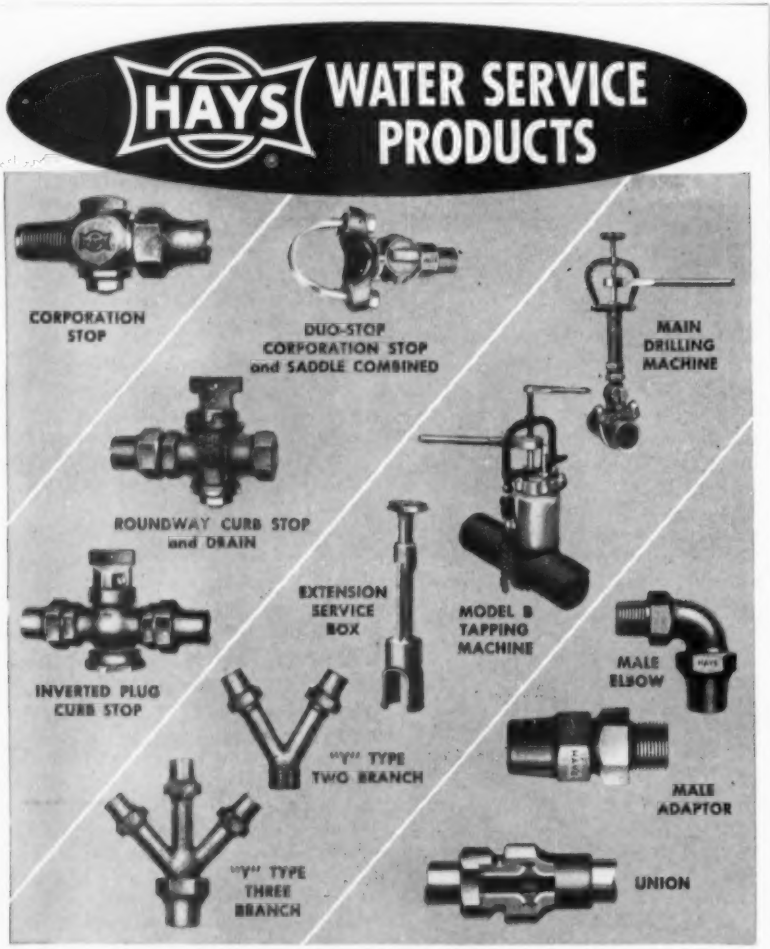
Rate of Settlement As a Sludge Index

The commonly used sludge index based on settlement in 30 minutes is faulty in that, after the first few minutes, the sludge collected begins to consolidate, and the total, as collected and measured in a graduated cylinder, is reduced by such consolidation. This largely masks the quality of the sludge. The most useful guide for assessing the ability of an activated sludge to purify sewage is the change in the *rate* of settlement before consolidation begins. The authors found that this period lasts for about 6 minutes. They therefore propose the use of a 6-minute period of settlement instead of 30 minutes, the settlement being measured at one-minute intervals until the apparent rate of settlement begins to decrease. Details for using this method are given.

"Settlement of Activated Sludge." By John Finch and Harold Ives, Rotherham, England, Sewage Disposal Dept. *Wastes Engineering*, May.

Accelerated Sludge Digestion

Since 1948 the author has operated a pilot plant at the Iowa City Sewage treatment plant, and carried on laboratory studies, which resulted in the development of a sludge digestion process which makes it possible to complete the anaerobic decomposition of sewage solids in approximately one-third of the time currently considered necessary; making possible loading rates of 0.345 lb. of volatile solids per day per cu. ft. of digester volume and at tank displacement periods of 7.2 days. A well stabilized sludge is produced. The process requires the recirculation of diffused gas throughout the



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digester contents to bring the seed sludge, the raw sludge, and the gas into intimate contact; while the digester is maintained at a uniform temperature of approximately 95°. The tank is provided with a cone-shaped bottom in which most of the grit is deposited and removed through the sludge withdrawal pipe. The process has been employed for several months in a 106,000 cu. ft. tank of the Columbus, O., plant. The superintendent of that plant, James H. Blodgett, says that experience at his plant has shown the need for a method satisfactorily to concentrate the digested sludge; also for an investigation of the effect of higher tank temperatures on the process.

"Studies of Accelerated Digestion of Sewage Sludge." By Philip F. Morgan, Prof. of San. Eng., Iowa State University. *Sewage and Industrial Wastes*, April.

Clarification of Laundry Waste Water

A study was sponsored by the Navy Dept. to develop a method for assuring maintenance of high sanitation standards for military personnel at stations where natural water supplies are inadequate. Such a method was developed based on the flotation of flocculated chemical coagulants. It reduces by 87%, and potentially up to 95%, the freshwater requirements for laundering where soap is employed as the principal detergent. The waste is coagulated, flocculated, diffused air being applied, and the flocculated coagulants adsorb and entrain the suspended or colloidal soils. The sludge formed rises to the top and is skimmed off.

"Clarification by Flotation and Re-use of Laundry Waste Water." By Herbert J. Wollner, Victor M. Kumin and Peter A. Kahn, Am. Conditioning House, Inc. *Sewage and Industrial Wastes*, April.

Arguments for Sewage Lagoons

Sewage lagoons are being operated in many places in the north, including North Dakota, South Dakota, Montana and Wyoming. The Oregon, Nebraska and Washington State Health Departments have recently approved the idea; as have four Canadian provinces. The North Dakota Department recommends seepage from lagoons up to ¼-in. per day on North Dakota soils; but when they are located over limestone or sandstone, underground

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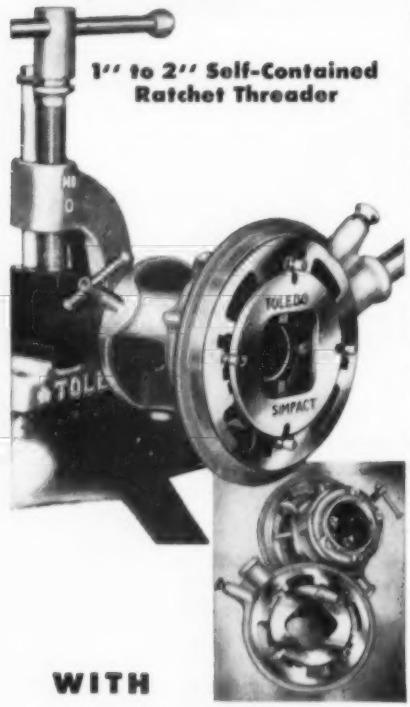

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crevices may move contaminated water considerable distances. Sunshine to promote algae growth is an important factor. The effluent from a lagoon contains a lower coliform count than those from most sewage treatment plants unless they are chlorinated. Comment from I. Nusbaum on Southern California conditions is included.

"The Case for Sewage Lagoons." By W. Van Heuvelen, N. D. State Dept. of Health. *PUBLIC WORKS*, June.

Municipal Refuse Collection in Iowa City

Municipal garbage and trash collection replaced contract service in Iowa City in May 1953. Before this, the collection had been irregular and unsanitary and complaints averaged over 3,000 a year. Now complaints average 3 or 4 a week. Also, operation of the sanitary fill is more efficient and sanitary. Under contract collection, the cost of garbage collection per householder per year was $4.16; now it is only $2.53. Collection of both garbage and refuse costs 12 cents per week per household. The city collects practically all kinds of refuse except tree trimmings and branches more than 2 in. in diameter. The city purchased four new 2-ton trucks, two of them with compacting bodies. The use of these has reduced refuse collection costs, promoted cleanliness and sanitation, and eliminated many injury hazards to the collectors.

" Complaints Reduced 95 Percent by Municipal Refuse Collection." By David A. Bingham, City Manager's Office. *PUBLIC WORKS*, June.

Cleaning Filter Cloths

Replacing filter cloths on vacuum filters is expensive in time, labor and material, and many methods of lengthening the lives of cloths have been tried. These include reducing the amount of lime used, decreasing the spacing of the spiral-wound wires; cleaning with weak muriatic acid, oxalic acid, oakite, hydrochloric acid with an inhibitor. At the Back River Plant of Baltimore, Md., a method has been used during the past few years which has given the filter cloths an average life of more than 4,000 hr. A list of data from 35 vacuum filter plants shows lives of filter cloths varying from 72 to 1,500 hrs., with Baltimore's 4,155 alone exceeding the latter, obtained in Chicago. Prior to 1952, chlorinated copperas was used at Baltimore as a coagulant, and the average life was 2,037 hr.; then ferric chloride was substituted and the life doubled. But the long life is attributed chiefly to the cleaning method. The cloth is cleaned, while revolving slowly on the filter, by using a water spray for about ½ hr. every 8 hr.; usually a low-pressure spray suffices, but in some cases a high-pressure shade tree sprayer is used.

"Cleaned Filter Cloth Lasts Longer." By C. E. Keefer, Dep. Sew. Engr. *Water & Sewage Works*, May.

Treating Pipe Mill Waste

A plant of the National Supply Co. at Ambridge, Pa. discharges into the Ohio river an average of 5 mgd of industrial waste. Before treatment, this waste contains mill scale, dirt and sand, combined with oil and grease. This is treated so successfully that the effluent is cleaner than the river which receives it. It is passed through a trash rack, a Dorr Detritor, through a bed of Raschig rings to a primary settling tank equipped with sludge and scum removal flights. The effluent from this passed through another bed of Raschig rings to a secondary settling tank, which has no scrapers or skimmers, and thence to the river. The sludge from the settling tanks is pumped to lagoons, which occupy more than an acre; where the liquid separates from the sludge by evaporation and runoff.

"Pipe Mill Waste Water Treatment." By M. G. Van Voorhis. *Water & Sewage Works*, May.

Planting at Sewage Plants

The writer suggests that the engineer designing a sewage plant show on the general plan any trees he intends to have planted, and also specify the species to be planted, and where. Trees should be selected suitable for the soil and their location, and should be rapid growing. Those shedding leaves should not be placed near filters. On wet land (often found where sewage works are located) alders, willows, poplars, and silver birch will thrive. For dry, sandy soils, conifers are generally suitable. For clay soils, oaks, maples, horse-chestnuts, poplars, barberry shrubs, roses may be selected. For places exposed to much wind, sycamores, cypresses, limes and some of the pines are suitable.

"Sewage Works Planting." *The Surveyor*, April 10.

Other Articles

"Belgian Congo Treats Sewage by Modern and Old Methods." Report of a survey made in 1953. By M. Le Bosquet and Harvey F. Ludwig, engineers U.S.P.H.S. Wastes Engineering, May.

"Sanitary Fill in Swamplands" at Rochester, N. H. and Seattle, Wash. American City, May.

"Fly Control at a Sewage Treatment Plant." By W. N. Wells, Supt. Sew. Treat. PUBLIC WORKS, June.

"Trickling Filter, Vertical Separators Aid an Experimental." By E. F. Gloyna, Prof. of Civ. Eng., Univ. of Texas, and Mansel Smith, Supt. Austin Sew. Treat. plant PUBLIC WORKS, June.

"A Sign of Progress, Sewage Treatment and Sewer Extensions," at Enid, Okla. PUBLIC WORKS, June.

"Radium as a Tracer in Sewage Flow Measurements." By T. G. Bullen and W. F. O'Connor, Dept. of Pub. Wks., Westchester Co., N. Y. Sewage and Industrial Wastes, April.

"Reconstruction of Sewers." A detailed description of English methods. By J. O'Connell. Contractors Record (England), May 5.

"Fungi in Polluted Water and Sewage." By Wm. Bridge Cooke, Mycologist, USPHS. Sewage and Industrial Wastes, April.

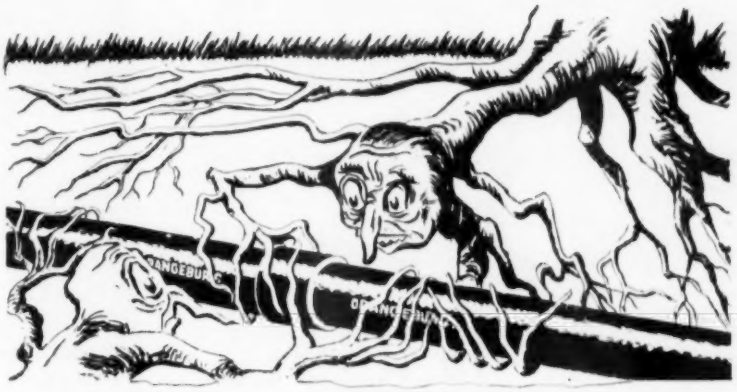
Peach canning wastes disposal. "Canning Plant Waste Problem Solved by Simplified Procedure." By R. S. Ingols, H. W. Hodgden and H. E. Miller, Georgia Inst. of Technology. Water & Sewage Works, May.

• • •

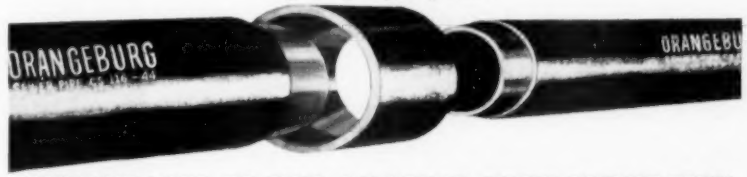
A New Type of City-County Health Organization

All city and county public health activities for the city of Indianapolis and Marion County, Ind., have been consolidated in a new municipal corporation which has all the powers of the usual municipality. It can make and adopt ordinances, levy taxes, buy and sell property, issue bonds and do many other things. It is governed by a five-man board, three from the city and two from the county, who are paid token salaries. In addition to normal public health functions, the new corporation operates public hospitals and the nursing and health services for the schools. All local health boards have been dissolved.

ORANGEBURG ROOT PROOF PIPE



for dependable sewer lines from the house to street main or from house to septic tank. For conductor lines from down spouts . . . storm drains. For other non-pressure outdoor uses requiring tight joints.



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An independent investigation of Orangeburg installations by a prominent sanitary engineer has substantiated the fact that Orangeburg is an excellent material for sewage disposal.

A summary of this report will be sent on request. Write Dept. PW74

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Further information concerning ATLAS JC-60 may be obtained by writing for ATLAS BULLETIN M20-3.

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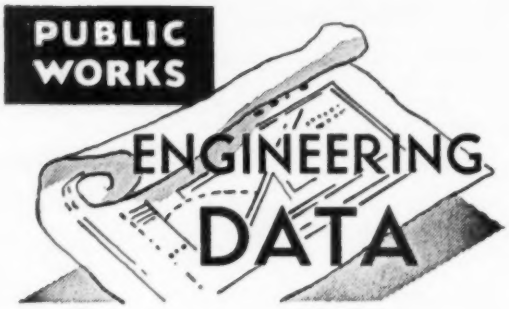

New Surfacing and Patching Material for Concrete

The Georgia Engineering Experiment Station, Georgia Institute of Technology, Atlanta, according to Highway Research Abstracts, has developed "Surco," a mixture of a liquid synthetic rubber and a dry cement paste which, when applied over concrete, is said to provide a long-wearing surface, resistant to water, impact, and abrasion. In addition to its application to concrete masonry surfaces, it will also bond to metal, glass, plaster, plaster board, stone and wood, and may be applied over large areas without the use of anchoring clips or expansion joints. It is said to be applicable as a moderately resilient surfacing material, as well as a patching composition for all types of concrete surfaces.

The material, basically an off-white color, can be produced in a variety of colors by incorporating various types of colors and aggregates. When properly compounded, it can be sanded down to produce attractive terazzo or artificial stone effects. The material, which can be mixed in either a mortar box or a small mechanical mixer, produces a paste similar to the consistency and working properties of plastic. On the job, this paste is applied to the surface and finished-troweled immediately. It is ready for traffic within 12 to 24 hours.

Using Sludge Gas Saves Money at Toledo

Savings due to the use of sludge gas at Toledo, O., during 1953 amounted to $11,336.20, according to the report of Arthur Niles, Commissioner of the Division of Sewage Disposal. The total saving due to the use of gas engines driven by digester gas has totaled $245,099.80 since 1937. Also, during the year, 920.29 tons of Tol-e-gro, which is pulverized dried sludge, used as a fertilizer, were sold for $12.849.33. The net profit on this, aside from overhead and fixed charges, was $7.622.14. The processing cost per ton was $5.68. Overall cost of sewage treatment was $20.50 per million gallons. The volume of sewage flow was the lowest since 1946; and rainfall also was down to 22.95 ins., the lowest since 1934.

Speed Limits for Trucks vs Passenger Cars

Efforts are being made in some states to keep truck speeds below that of automobiles so that cars will not be delayed by trucks. Florida allows 60 mph. for cars and 50 for trucks in the daytime and reduces this to 50 and 45 mph. at night.

Georgia permits 60 mph. for cars; 55 for trucks less than 10,000 pounds; 45 for trucks between 10,000 and 16,000 pounds; and 35 for trucks over 16,000 pounds.

Highway Crossings Over "Navigable Waters"

A Hoover Commission Task Force under the chairmanship of Admiral Ben Moreell has been making a study of Water Resources and Power. As a part of the work they are investigating the present requirements for highway crossings over navigable waters. Present regulations, which have been in force a long time, require that the U. S. Corps of Engineers, who issue permits, must give navigation issues "superior" rights. This often results in very expensive highway construction to provide the required clearance under bridges. Many highway authorities contend that this increases highway costs far beyond the benefits to navigation. The Task Force is considering the problem with the idea of recommending changes in present legislation if found necessary.

• • •

Road Reconstruction Program Pays Off

A further transition from a major program of rehabilitation to a program of new highway construction was accomplished in 1953 by Wayne Co., Mich. Asphaltic resurfacing of cement-concrete highways occupied the spotlight in recent years, leaving little money available for new highway construction work. This picture is changing, however, and 1953 saw a further reduction in resurfacing work. Approximately 640,000 square yards of asphaltic material were placed in 1953, roughly half as much as in 1952, and one-third of the 1951 total. Thus, a condition of normalcy is being approached in this work.

It is a pleasure now to look back at the results of the accelerated resurfacing program. It is no longer necessary for a motorist to keep his eyes on the surface of the road in order to dodge chuck-holes which were forever in his path. This has restored some of the pleasure of driving on Wayne County's highways, not to mention the saving in wear and tear on motor vehicles; and what is probably more important, a huge investment in concrete highways will pay further dividends. This sustained program of resurfacing will take some of the stress off rehabilitation work in the next few years and permit the Board to start some of the many urgently needed expansions in the highway system.

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Vibratory Median Delineators

The Illinois Highway Dept. conducted tests to determine the best way to prevent encroachment on medians. As between visual and physical warning to drivers of encroachment, the latter was considered preferable, using intermittent raised bituminous sections of the median, spaced 12.5 ft. center to center; 1-in. height of section, with a face slope of 30°; 6-in. length of base; placed normal to the center line; the units having rounded noses or ends. Different designs were tested at speeds of 35 to 80 mph and noting the physical sensations felt by the driver.

"Vibratory Median Delineators," By R. J. Furback, Ill. Div of H'ways. *Roads and Engineering Construction*, April.

Draining Streets Without Storm Sewers

Boise, Idaho, has practically no storm sewers, most of the run-off from the streets being carried in the gutters to ditches or drains which empty into the Boise river. Intersecting streets are in some cases crossed by pipes, which often become stopped with papers and leaves. The city has used a new form of construction at several intersections along its main highways, one instance of which is described. Here the water from the main street flowed to an inlet just around the corner in the intersecting side street, then through a 4-in. pipe under the cross-walk to the other side of this street. The curb is a little less than 6 in. high, and where this pipe could not carry all the water, the surplus flooded the sidewalk. To remedy this, they substituted an 8-in. pipe for the old 4-in. and also provided an overflow for the surplus by constructing a dip across the side street 3 in. higher than the theoretical gutter grade (nearly 3 in. below the curb grade). As the main street is an arterial one with a stop sign at the side street, the dip is not objectionable to traffic.

"Draining Downtown Street Corner Without Storm Sewers." By J. L. Morris, City Engineer. *Roads and Streets*, May.

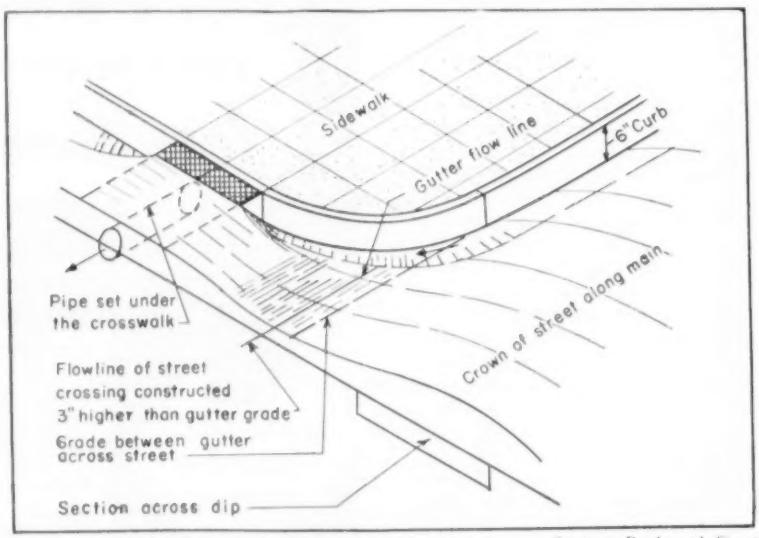
Chemical Control of Weeds and Brush

New York State last year contracted the application of herbicides to 3,500 miles of state highways. The practice adopted was to cut brush an inch or more in diameter and spray the weeds; spraying three times—spring, summer and fall. The spray used was 2,4-D and 2,4,5-T. Contract was let for three years at a cost of $29.50 per mile per season. The contractor, McMahon Bros., developed a vehicle which enabled one man both to drive and handle four spray nozzles, which can be adjusted to cover any desired depth up to 60 ft. Each truck carries two tanks carrying 150 gal. of chemical and a 1,000-gal. spray tank. This truck could cover both sides of a 25-mile stretch of highway in 8 hrs.

"Chemical Weed and Brush Control by Contract." *PUBLIC WORKS*, June.

Highway Maintenance By Contract Increasing

A special committee of the AASHO has made a comprehensive study of contract maintenance operations by state highway departments as of the year 1952. This showed that 38 states performed various types of maintenance by contract, this including $100,000,000 of the $600,000,000 total spent for road maintenance. The states reported 38 different types of maintenance work that they believe could be handled by contract. The major contract items reported included $38 million worth of surface work involving road mixes, high-type mixes and treatments; $6 million for buildings; $5


Sidewalk
Gutter flow line
6"Curb
Pipe set under the crosswalk
Flowline of street crossing constructed 3" higher than gutter grade
Grade between gutter across street
Crown of street along main
Section across dip

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million for structures, and $10 million for aggregate production and haulage. Among the items were county snow agreements; sealing pavement joints; guard rail and bridge painting; surfacing of shoulders; and chemical weed killing. The majority of the states reported their experience as "satisfactory" or "very satisfactory." Some departments had difficulty in preparing definite specifications and units of work. Other difficulties were lack of sufficient supervisory force, the large amount of equipment already owned by the state; legal requirement that some convict labor be used, and other state laws and regulations. The Associated General Contractors have recommended specification features and other procedures calculated to obtain maximum satisfaction in contracting highway work.

"Highway Maintenance by Contract a Growing Business Among States." *The Constructor*, May.

User Taxes Paid by Vehicles

State motor vehicle taxes totaled $3,088 million in 1952. Of this amount, fuel tax payments accounted for $1,968 million or 64 percent; registration-fee payments, $910 million or 29 percent; motor-carrier tax contributions, $64 million or 2 percent; and drivers' licenses, miscellaneous fees, etc., $146 million or 5 percent.

Comparisons established in this study show that passenger cars represented 83 percent of all motor vehicles registered, accounted for 81 percent of the traffic on our highways, and contributed 65 percent of total State road-user tax payments. If panel, pickup, and other light trucks are combined with passenger cars the percentages become 93, 89, and 74, respectively. Medium and heavy trucks and combinations accounted for 6 percent of the registrations, 10 percent of the traffic, and contributed 24 percent of the road-user payments. Tractor-semitrailers and truck-trailers included in the preceding group accounted for 1 percent of the registrations, 3 percent of the travel, and 12 percent of user-tax payments. Buses accounted for less than 1 percent of the registrations and travel, and 2 percent of the user-tax payments.

On the basis of highway-user tax payments per mile of travel, passenger cars and light trucks paid one-half cent per mile, buses paid 1.6 cents, and medium and heavy trucks and combinations paid 1.5 cents. The rate for truck combinations alone is slightly more than 2 cents per mile of travel, tractor-semitrailers paying 2.1 cents and truck-trailers, 2.7.

"Estimate of User Taxes Paid by Vehicles in Different Type and Weight Groups." By Edwin M. Cope, John T. Lynch, and Clarence A. Steele, Division of Research, Bureau of Public Roads. *Public Roads*, June.

Designing Horizontal Curves

A study of passenger car speeds on horizontal curves of two-lane rural highways has been made by the Bureau of Public Roads, based on observation made at 35 curves located in five states. The data and conclusions are offered as aids in designing such curves. It was observed that superelevation apparently has no effect on vehicle speeds, and the utilized coefficient of side friction is relatively small when the superelevation is high. However, there is a close relation between "unit superelevation"—the rise per foot of width per degree of curvature—and safe driving speed. Few vehicles exceed a safe speed on horizontal curves designed with a

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This spreader attachment, which is optional equipment with the Moto-Patcher, is 8 ft. wide and is fully adjustable to specified grade and crown, insuring a uniformly smooth surface even on irregular pavement.

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unit superelevation of more than 0.005 foot per foot of pavement per degree of curvature.

Where the minimum sight distance is 400 feet or more, drivers travel at speeds from which a stop can be made within the available sight distance, but where the sight distance is below 400 feet, drivers travel at speeds from which a stop can be made within the available sight distance only when the perception and reaction times are ignored. Speeds are considerably lower on horizontal curves than on vertical curves with the same minimum sight distances.

"It is evident that if roads are to be built safely for the accommodation of actual driver behavior—and this seems logical—the design of horizontal curves on two-lane rural highways should take into account unit superelevation, and should provide a minimum sight distance of at least 400 feet, allowing for reasonable perception, reaction, and braking time. That an adequate margin of safety is needed is evidenced from the implication in the study results that driver speeds are more controlled by the obvious danger of running off the road, when negotiating a horizontal curve, than by the possible hazard of an unseen object where sight distance is limited on either horizontal or vertical curves. The physical stress of centrifugal force can actually be felt, while the sight-distance hazard can only be imagined."

"Driver Performance on Horizontal Curves." By Asriel Taragin, B.P.R. *Public Roads*, June.

Surfacing Steep Grades

Duluth, Minn., is this year resurfacing about 10 miles of arterial streets as part of a program begun in 1945. Most of the streets have steep grades, some up to 27%. This and the fact that the temperatures range from 47° below zero to 106° above materially affect the choice of type of pavement. That used is the highest type of asphaltic concrete, made from 100% crushed coarse aggregate ⅝-in. maximum size, fine sand, mineral filler, and asphaltic cement. The asphalt penetration used was at first 70-85, but with experience has been increased to 120-150, which seems to give the best results. On grades above 7%, the asphalt content is kept as low as possible—4.5% minimum and 5.5% maximum. On ordinary grades about 6.0% is used. All kinds of pavement, including brick and con-

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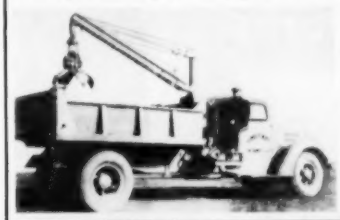

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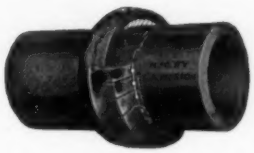

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crete, are being resurfaced. On the better concrete, the joints and cracks are cleaned out and filled with rubberized asphalt to seal off subsurface water.

A high crown formula is used which gives a 6-in. crown on narrow streets, up to 15 in. on the wide ones. The surfaces of these streets dry almost instantly after snow has been plowed off; keeping the driving lanes dry 90% of the time during the 50 to 70 days of freezing and thawing in the spring and fall; thus greatly decreasing the wear caused by traffic.

"Duluthians Ride Safely on Their High Crown Streets." By Arthur W. Tews, City Engineer. *PUBLIC WORKS*, June.

Separation of Traffic Lanes in the Netherlands

Discussing Netherlands practices in the separation of traffic lanes, the author says that, for concrete roads, the joints between slabs suffice. For asphalt streets, white paint or plastic lines are used. On brick or stone block pavements, painted lines soon have an untidy appearance, and it is better to separate the lanes with lines of stone blocks or bricks of a color differing considerably from that of the pavement itself, either continuous or broken lines. The best width of line is 10 cm. A glossy line is not desirable, but some roughness, as by use of glass beads, is necessary to reflect the light from the cars' lamps back to the drivers.

"Verkeersgeleiding op Klinkerwegen." By D. Thoenes. *Wegen*, April.

Steam Cleaning Of Construction Equipment

Use of a steam cleaner reduces down time by revealing worn or faulty parts in time to replace or repair before expensive breakdowns occur. Keeps operations going in winter. Saves up to 40% of the mechanics time by eliminating grease wiping. Cuts painting costs. Checks wear by removing abrasive, corrosive dirt, grease and road oils. Increases efficiency of equipment and operators. Contractors have reported doubling the life of crawler track rollers by steam cleaning them every 24 hr. It was said that one man with a steam cleaner can do as much maintenance cleaning in one hour as he could in 8 or 10 hours with brush and bucket.

"Effective Use of Steam Cleaning on Construction Equipment." By Charles Mathewson. *Roads and Engineering Construction*, April.

Other Articles

"Surfaces for Trunk Roads. Selection and Application." Hot rolled asphalt, fine cold asphalt and precoated chips, and carpets of coated macadam discussed by English highway engineers. The Surveyor, April 10. Contractors Record, April 21. Roads and Road Construction, May.

"Electrical Subsurface Exploration Simplified." An entirely new method of interpretation of data so obtained. By H. E. Barnes, Michigan State H'way Dept. Roads and Streets, May.

"Dryers". Recent and needed developments in their construction and use. An editorial. Roads and Streets, May.

"Traffic Control and Lighting for Present Day Highways." A thorough discussion of the latest practice in signs, pavement markings and signals and in street and highway lighting as employed by the most progressive highway departments. By George E. Martin PUBLIC WORKS, June.

"Good Engineering and Inspection Is Important in Street Work." By Marion

THIS New inexpensive towed-type spreader features an exclusive "staggered wheel" arrangement consisting of 10 pneumatic tired wheels keeping the unit level at all times - maintaining a level finish course.

Spreads evenly from edge to edge - cut-off runners on each side form untapered sharp edges.

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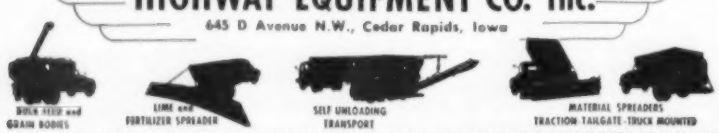
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E. Boriss, City Engr., Chattanooga, Tenn. PUBLIC WORKS, June.

"Modern Macadam Pavement Chosen for Heavy-Duty Expressway" near Columbus, Ohio. By Fred Swineford, of Macadam Pavements, Inc. PUBLIC WORKS, June.

Top-dressing method of resurfacing asphalt roads in Inglewood, Calif., finds a "Job-Developed Scarifier a Big Help —Roads are Heated, Dragged and Repaved." Engineering News-Record, May 20.

• • •

Selecting a By-pass Route

Route 22 in the Bethlehem-Allentown-Easton area of Pennsylvania has been a traffic bottleneck for many years. According to E. L. Schmidt, Secretary of Highways three alternate relief routes were studied by the Department of Highways to determine which improvement would return to the road users the greater benefit per dollar of cost; and the amount of relief of existing congested traffic conditions that each of the alternate improvements would provide.

The three alternate routes were identified as (1) South Route, (2) Intermediate Route, and (3) North Route.

The over-all length of the by-pass route finally selected is approximately 22 miles. It is on new location throughout and follows a general west-east direction, leaving the existing Route 22 at Chapmans on the west, and by-passing Allentown and Bethlehem, continues over the new bridge approach in the city of Easton to the toll bridge over the Delaware River.

Built-in safety features have been provided in the design of the by-pass route. A 16-foot earth median strip separates traffic moving in opposing directions. This feature virtually eliminates head-on collisions and reduces glare from headlights. Grade separation structures at all important cross roads avoid stops and delays and accidents due to cross traffic. Lane widths of 12 feet make ample provision for the wider commercial vehicle and the higher operating speeds of present-day traffic.

• • •

Asphaltic Resurfacing Program

Resurfacing on old portland cement-concrete pavement includes cleaning all loose material and temporary bituminous patch-work from the existing pavement, and cutting out expansion joints to a depth equal to the width of the joint. Castings must be adjusted to the finished grade, and depressions levelled with binder material. A "tack" coat of asphalt is then sprayed on the old surface to bond the new surface. A one-inch binder course is then applied by an asphalt paving machine, followed by a one-inch wearing course, for a total thickness of 2 inches. When the pavement is not curbed, the final operation is to apply sufficient gravel to bring the shoulders up to the new surface.

One of the nicer features of working with an asphaltic material is that pavement defects, such as settlements or unusual irregularities in the surface, may be "ironed out" by applying additional binder material. For instance, where drainage has been inadequate due to uneven settlement of the pavement, varying the thickness of the asphaltic material makes it very easy to rectify the condition. The cost of resurfacing did not change materially during 1953. The average cost of resurfacing a mile of 20-foot pavement in 1953 was approximately $25,000. Annual Report, Wayne Co., Mich.

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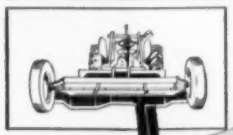

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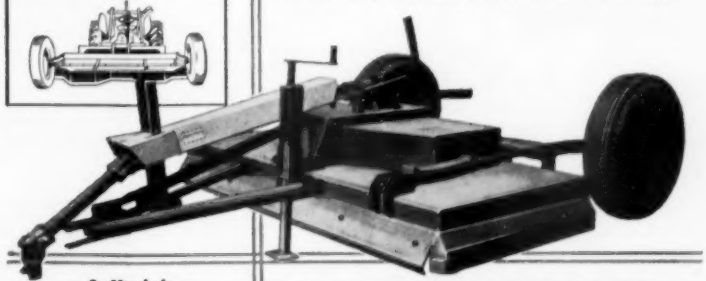

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Mr. Public Official: What Can You Do About Safety?

H. D. JONES

A PERTINENT question needs to be directed to you as a public official. Better, you should ask yourself: "What can I do about safety?"

Of course, the answer is that there is plenty you can do, but how much you do will depend to a large extent on your station, and just how interested you are in humanity.

Let's face the facts! We are lagging behind in employe accident control. When your present tenure in office ends, will you have the satisfaction of having inaugurated a well-organized safety program for your department, city, or county? If you can truthfully say "Yes"—that will be good; if, "No", you have lost a golden opportunity to serve your fellow men.

If we are ever going to reduce the tremendous inroads being made by accidents into the manpower of our nation, we must act quickly. The need is so urgent that bills have been introduced in the United States Congress and Senate (S.360, Murray—H. R. 4145, Bailey) that would make safety mandatory for both industry and public employment. Should such a law be enacted, safety programs will be set up and supervised by the Federal Government. Let's avoid this by doing our own housecleaning—by setting up our own accident prevention program, and doing it well.

Let Me Illustrate!

There is the official who was worried about his high accident frequency in the garbage collection department. He asked: "What can I do?" There are lots of people who already know one of his troubles. Garbage trucks keep moving. The collectors grab cans, swing them on the bed or trough, misjudging the speed. The result is a mashed or lost finger. Then the collectors run to swing on the step, to catch a ride to the next can, miss the step, skin a shin, or fracture a leg. All of these accidents cost man-hours and real money, far more than you realize. How many employes do you have, Mr. Official? This item has run close to $100.00 a year for each employe. And this doesn't take into consideration the hidden costs of pain, anxiety, and grief.

Many people ask what to do, or where to get a qualified man for this or that job. We always have to work with what we have. So I suggest that you take any one of your various jobs, starting with your worst headache for accidents. First analyze your manpower; then, the job, step by step. You will likely find many unsafe practices, probably, even faulty equipment. Many have learned the hard way after paying and paying for lost time from mashed fingers, fractures, sacroilliac sprains, and related conditions.

I recently read a City Garbage Container Regulation that evidently was written by a city manager who had grown weary of paying claims from strains. The regulation eliminated all 55 to 60-gallon drums —reduced the size to 25 to 32-gallon maximum and advised a separation of the garbage as to paper, food, ashes, and so forth, in different containers.

Every group or gang has a leader other than the Foreman or Supervisor. So pick out this fellow and sell him on safety. In a talk at the National Safety Congress before the

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installs or renews pipe under pavement

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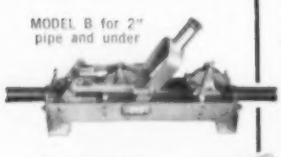

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Public Employes group several years ago, I stated that safety is an individual responsibility. I note that a recent Washington meeting suggested the development of this responsibility, and that's exactly what has to be done. Your life is the most precious thing you possess. It is up to you to preserve it for useful endeavor, livelihood, your family and loved ones. You can't buy another one at any store in town.

I can't be safe for you and you can't be safe for me. It is an individual responsibility, and the sooner we can sell this to the public the sooner we will have the type of safety we all want to brag about.

Maybe, the leader of the group or gang is a difficult person to handle, but there is always a way. Maybe, you will have to pray with him, and believe me we need more prayers in safety today than ever before. Being an ex-service man, I know. Nothing is more comforting when you are in the shadow of death than to talk with your Maker. So win your leader for safety: talk to your men frequently; call on the leader and then other members of the shift, get their ideas, thoughts and suggestions. You will build them up individually to realize that safety is their individual responsibility. They will actually take pride in doing their job, whatever it may be, in a safe and sane workmanlike manner.

Incentives always help and there are many types and kinds employed by various departments: Certificates, pins, extra holidays, pay bonuses, and prizes. I have seen these run from show tickets to a TV set, on up to a house and lot, and believe me I have seen men weep when they have lost out on an award because, perhaps, of one careless moment.

Costs of Accidents

Perhaps some would like a clearer picture of accident costs better to understand the gigantic proportions of the safety problem that confronts us. The authentic source for such data is found in "Accident Facts—1953 Edition" as compiled and published by The National Safety Council (425 N. Michigan Avenue, Chicago, Illinois). It lists accident costs in 1952 as $8,700,000,000.

Isn't it high time we were all doing an all-out against such needless waste? Mr. Public Official, the overlooked quotients in safety—public employes—are included in that staggering cost.

You can not legislate or enforce

safety but you can educate and set the proper example. Safety comes from the heart and mind. It will be the exception rather than the rule that you may have to discipline an employe. I recall some instances, one in particular. An employe had been advised several times as how to do a certain job, and had been shown by his foreman. But he wouldn't follow instructions. So the mild-mannered supervisor faced him squarely and ordered him to go home without pay for one week and advised the worker that if he could not remember by that time his services would not be needed.

Good Safety Engineers, Directors or Supervisors never forget the human element. Abe Lincoln once said: "If you want a man to go your way, go down the road with him aways." Whether you are in the East, North, South, or West the milk of human kindness pays tremendous dividends. Remember always that we must educate not only public employes, but the citizenship of our country, and particularly our boys and girls. We must teach them that thoughtfulness and courtesy go hand in hand with safety, and never to leave these two essentials at home, locked up in a trunk. They must be ever present if you are to participate in the dividends safety pays!

We must get the facts, as well as face them; then do something about them. I knew a valued employe who had served seven years in a hazardous job without a single accident. Furthermore, he had kept his equipment in excellent shape. But all at once he had two bad accidents that cost hundreds of dollars to repair. Fortunately, there were no personal injuries. At that turn of events, a trip and personal call was made to ascertain the cause. The employe wept as he told his story (after seven years of perfect operation): Two weeks before he had buried his only child. His wife was desperately ill. The neighbors were kind and looked after her during the day, but at night he had to give her medicine every two hours, do the house work, and as he exclaimed, "I am dead on my feet." He had to be transferred to a less hazardous job until his wife improved.

Safety in both human relations and public relations is needed today as never before. You cannot prevent the birds of sadness from flying over your head, but you can prevent them from nesting in your hair.

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PUBLIC WORKS
EQUIPMENT NEWS

Published Monthly **July, 1954**

Loss-in-Weight Recorder for Volumetric Feeders

Omega has redesigned and improved its equipment for checking and recording the rate of feed of volumetric feeders, both large and small, by the Loss-In-Weight method. Applications include: Water treatment (particularly fluoridation), sewage and waste treatment, and any chemical processing operations where records of chemical feeding are desired.

The Loss-In-Weight recorder is compact and simple, with no motors, switches, relays, clutches or electrical parts (except for simple chart movement) to require maintenance. When attached to a volumetric feeder, it does not increase the space requirements of the standard feeder. An indicator scale continuously shows the weight of chemical left in the hopper and indicates when hopper refilling is necessary. Standard 24-hour recorder charts in 50 or 100 lb. capacity (for the Omega Model 50 Disc Feeder) records the time of hopper reloading and gives a continuous and exact record of feeding operations. For further information, write Omega Machine Co., 345 Harris Ave., Providence, R. I., for Bulletin No. 80-L13, or circle No. 7-1 on the coupon.

Chemical feed records are provided by this compact loss-in-weight recorder

Machine Builds Asphaltic Curbs Without Forms

This machine will lay, compact and finish asphaltic curbing at the rate of 7½ to 10 ft. per minute, without the use of forms. The curber propels itself and lays vertical or sloping curb in a straight line or around curves. A worm screw handles the material and compacts it through a moving form. More information from Wall Mfg. Co., Box 5006, Winston-Salem, N. C., or circle No. 7-2.

Controls Odors, Flies and Rats in Refuse Disposal

Here is a liquid compound, called "Sanifill," which is claimed to control disagreeable odors on garbage dumps and land fills; to repel flies and most other insects; to destroy larvae or prevent the deposition of insect ova; and to prevent rats from living in the dump or fill. Half a gallon of the compound is mixed with fifty gallons of water for use as a spray. Bulletin No. 12 gives a lot of information on its use with the sanitary landfill method, on controlling odors from refuse, on preventing insect and rodent infestation; and other uses, including deodorizing refuse trucks containers and other equipment. Get Bulletin 12 from Stewart-Hall Chemical Corp., 550 So. Fulton St., Mount Vernon, N. Y., or circle No. 7-3 on the coupon.

A PORTABLE ELECTRIC GENERATOR OPERATES THIS ROCK DRILL

An electric rock drill is powered by a 130-pound portable Homelite generator, permitting easy movement from job to job. It is said this tool will drill holes to 18 ft. deep; size of hole is not stated. It is equipped with a Bosch pressure blower which removes rock dust from the hole and prevents it from being blown into the operator's face. More information from Homelite Corp., Port Chester, N. Y., or circle No. 7-4 on the coupon.

Portable Homelite generator powers both rock drill and pressure blower

• • •

Perforated pipe packaged safely with Acme Steelstrap. This process (developed by Orangeburg Mfg. Co., Orangeburg, N. Y.) facilitates the handling and shipping of bundles of 8-ft. lengths of perforated pipe. It consists of corrugated board end covers and steel straps. The packages are strapped and sealed at the rate of 23 per hour. This process can be used to prepare other products for shipment. Detailed information from Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.

Graver Offers Package-Type Water Treatment Plant

A compact and complete package-type water treatment plant by Graver Water Conditioning Co., includes all equipment from inlet to outlet, including the clear-well, chlorinator, chemical feeders and proportioners, gravity or pressure filters, recarbonator when required, level and flow controls and instruments, and interconnecting piping. Standard layouts for the complete package plant are available in capacities from 0.1 to 2.0 MGD, special layouts being available for larger capacities.

The main unit in this low-cost plant is the Graver Reactivator, a cold-process water treating unit used for selective or simultaneous removal of turbidity, color, and organic matter, taste and odor; iron and manganese; and hardness, from water supplies. It is a self-contained, high rate unit of the solids-contact type, embodying within a single compartmented tank coagulation, flocculation, sedimentation, and sludge removal. The treatment is carried out with such efficiency that the detention time is only 60 to 90 minutes. The feature which accounts for the rapidity of treatment is the "seeding" process, which involves the continuous recirculation of a substantial concentration of previously formed precipitates through a zone in which raw water and chemicals are added. The suspended particles act as "seed" to which newly formed precipitates adhere. The speed-up of the formation of settleable solids reduces the detention time required for good settling.

The gravity filters for many plant capacities are completely shop assembled to achieve maximum economy in field installation. Instrumentation and controls are arranged to provide either manual or automatic operation. The operation of this plant is relatively simple, and is said to require only part-time supervision of a non-technical operator. Treatment results are guaranteed for every installation. For data, circle No. 7-5 on the coupon.

Spreader for Bituminous Concrete and Aggregate

Featuring a "staggered wheel" arrangement with 10 pneumatic-tired wheels insuring a level finish course, this towed-type spreader will spread depths from ½ to 8 in., and when the controls are in locked position, a consistent desired depth of spread is guaranteed. Since there are no wheels outside the hopper, it is possible to spread close to curbs or buildings. The hopper is large enough to accommodate the full tail-gate openings of standard truck bodies. Spreading widths of 8, 9, 10 and 12 ft. are available; and motor driven auger type agitators insure even feed for the 10 and 12-ft. widths. Rock up to 4-in. is handled. Full data from Highway Equipment Co., Inc., Cedar Rapids, Ia., or circle No. 7-6 on the coupon.

Traffic and Safety Line Marker. This machine is streamlined, compact, one-hand in operation; weighs only 20 lbs.; and has an all-metal sled-type roller spreader. It prints rather than sprays or brushes, is noiseless in operation and throws off no dust spray. Made by the Line-Markers Div., 137 Alexander St., Yonkers 2, N. Y.

Ten pneumatic tires insure a level finish course with this towed-type spreader

Four-in-One Unit Does Many Kinds of Work

A piece of machinery capable of handling a multiplicity of jobs is the new Drott "Four-in-One" hydraulic controlled attachment for International TD-6 crawler tractors. The Four-in-One can be immediately converted into a bullclam shovel, a bulldozer, a front-end loader or a clamshell by merely placing the "shovel-selector" lever in the desired position. This lever is in easy reach of the operator and shovel selection can be made either when the tractor is in motion or is standing still.

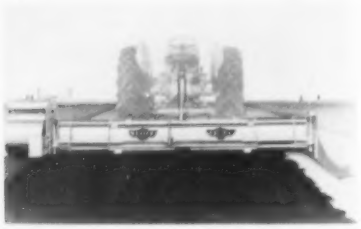
As a bullclam, the attachment is used for sanitary landfill and to transport dirt on short hauls. With the clam open, the shovel becomes a bulldozer, and depth of cut is regulated by the pitch of the blade. In the front-end loader position, the new unit has the same roll back at ground level as the standard Drott front-end loader.

In addition to the other four features, the unit can be used as a backhoe. Shovel capacity is ⅞-yd.; lift is 3,000 lbs.; overall weight of the unit and the tractor is less than 9,000 lbs. More from the manufacturer, or circle No. 7-7 on the coupon.

A new variable capacity-variable head centrifugal pump has been announced by Allis-Chalmers Manufacturing Co. for use in handling any consistence from water up to 5 percent paper pulp under varying capacity and head conditions. This unit consists of an internal by-pass bolted directly to a remachined single-suction centrifugal pump. Design gives a capacity range of 0 to full rating on pumps up to 35,000 gpm and heads from 15 to 100 feet. Both manual and automatic control installations are now in service. Allis-Chalmers Manufacturing Co., General Machinery Div., Milwaukee 1, Wis.

Spreads Base or Black Top 7 to 10 Ft. Wide

Operating as a fine-grader after the area has been rough-graded, this spreader removes high and low spots. Two long steel skids guide the cutting blade, providing a smooth base surface for the paving



materials. It will also spread, quickly and smoothly, black top to a smooth surface for the roller. Two 8-ft. steel skids at either end of the adjustable spreader blade serve as leveling guides. A roll, when attached to one end of the spreader and set even with the bottom of the spreader blade, operates on the level of the finished pavement. Widths from 7 to 10 ft. are provided by a simple adjustment. Full data from Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif., or circle No. 7-8 on the coupon.

Free-Running Clutch for Aggregate and Material Dryer

A manually operated free-running clutch is the newest and most important improved design feature on the Tarrant Model 7 dryer. The operator can now run the power source and the fuel and burner system without turning the dryer drum. Tests show that this is not only a convenience, but also increases the life of all wearing parts. The "Flash-Flame" dryer is fast and convenient; it can be put into operation in ten minutes and will dry a big variety of non-combustible materials. More from Tarrant Mfg. Co., Saratoga Springs, N. Y., or circle No. 7-9 on the coupon.

Wet weather patching jobs made easy with the portable "Flash-Flame" dryer

Vibratory Screed for Improved Paving Operations

The improved Jackson electric vibratory screed is advantageous on a wide range of paving jobs, such as municipal paving, highway widening and patching, walks, drives, alleys and similar operations. All that is necessary to convert it from one type of job to the other is to transfer the fittings to a plank of suitable dimensions and crown. Being vibratory in action it works up to and around manholes and other obstructions, undercuts at curbs or sideforms, strikes off to any crown, and can be readily rolled back for second passes. According to the manufacturer, it will handle any slab up to 30 ft. wide. It is operated from a Jackson portable power plant, which can generate both 3-phase and single-phase 60-Cy., 120-V., AC. The generator can also be used for lighting, and for operating vibrators and various other power tools. Complete details may be had from the manufacturers: Jackson Vibrators, Inc., Ludington, Michigan, or circle No. 7-10 on the coupon.

Using the Jackson electric vibratory screed to level a wide concrete slab

Hydrohoe and Hydrocrane Now Independently Powered

The truck-mounted Hydrocrane, an all-hydraulic $\frac{3}{8}$-yd. crane-excavator is now available as an independently powered machine. In addition to eliminating the restrictive influence of the power-take-off drive, there are other important advantages, such as fewer belts, shafts, hoses and other items requiring routine servicing.

A new attachment for the Hydrohoe has also been announced, utilizing "wrist-action" to increase both utility and speed of operation. There is increased digging force, less spillage and greater range of dumping into trucks. The operator can dig vertical or undercut walls and trenches that are deeper than they are long; and he can change the pitch or rake of the dipper

Independent power and "wrist-action" dipper are features of the Hydrohoe

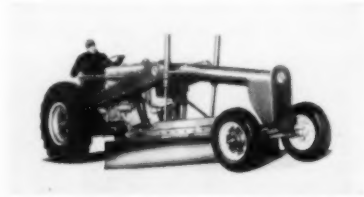
teeth during the digging in order to get the best cutting angle or to pry out rocks or expose piping which may be encountered.

Full details on both of these improved units can be obtained by writing Bucyrus-Erie Co., South Milwaukee, Wisc., or circle No. 7-11 coupon.

• • •

New M-B Unit Converts Tractor to Motor Grader

A low-priced grader has been announced by M-B Corp., New Holstein, Wisc. This grader is built into the 30 hp M-M RTI tractor and has a 10-ft. blade, with a tubular frame and four speeds forward. The grader can be attached or removed from the tractor unit in less than an hour. Many attachments are available, including snow plow, berm leveler, bulldozer and scarifier. For more details write to the manufacturer or circle No. 7-12 on the coupon.



Grader built into 30-hp wheel tractor furnishes a versatile low-cost unit

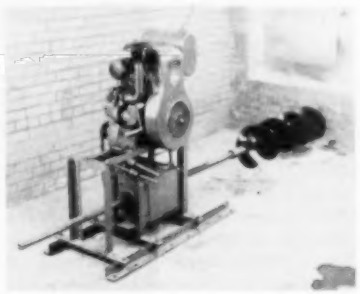
Threads Pipe, Operates Valves and Does Many Other Jobs

Though it weighs only 26 pounds, this portable drive unit will do a variety of jobs. It will furnish the power to thread pipe up to 8 ins. in size; it will open and close large gate valves; will roll boiler flues; drive post hole augers—and do many other jobs. It is attached to a pipe, for threading, like any ordinary pipe threader. Motor is ½ hp and the tool operates at 28 rpm. Facts from Thread-Ezy Mfg. Co., Corunna, Mich., or circle No. 7-13 on the coupon.

Operating a gate valve with the Port-A-Pony pipe threader and power drive

Horizontal Digger Saves Pavement Cuts

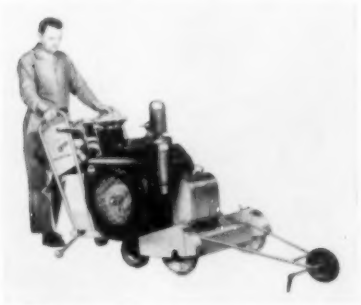
This heavy-duty horizontal digger, for cutting under embankments, highways, sidewalks, railroads and building foundations is great for laying water mains, sewers and conduits through such difficut places. It will work in clay, shale and soapstone, as well as in ordinary soils. The force-fed screw assures steady pressure on the auger at all times. One man can operate it and it will drill a 10-inch hole to 40 ft. and a 12-inch hole to 48 ft. Auger cutter heads can be removed and sharpened. The unit is chain driven from an air-cooled gasoline engine. More from J. R. Prewitt & Sons, Pleasant Hill, Missouri, or circle No. 7-14 on the coupon.



Save digging with a horizontal earth drill—just bore beneath the pavement

Powerful Saws for Cutting Concrete and Asphalt

Four hydraulically operated concrete saws, ranging in power from 15 to 36 hp, have been announced by Robert G. Evans Co., 7204 Wyandotte St., Kansas City 14, Mo. These "Target" saws have hydraulic control of blade lowering, 3-point suspension to hold the blade squarely in the cut, and a dual arbor blade shaft which permits mounting the blade for either right or left hand cutting. These saws are claimed to guide effortlessly anywhere on the job. They are available with either manual start or electric starter. They are adapted to any concrete or asphalt sawing, including cutting contraction joints. Full data from the manufacturer, or circle No. 7-15 on the coupon.



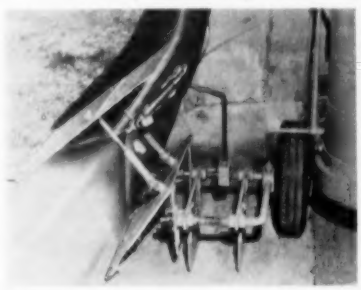
Blades of "Target' concrete saws are controlled by special hydraulic system

Portable lead burning furnaces. A new line of these furnaces has been announced by Hauck Manufacturing Co., Brooklyn 15, N. Y. They include wheel models of 200, 450 and 700 lbs. capacities; leg models are 125, 200 and 450 lbs. capacities. This type is claimed to melt 200 lbs. of lead to pouring temperature in exactly 10 minutes, larger or smaller quantities in proportionate heating time. These furnaces can be used on pipe line jobs where the furnace must be moved as the job progresses; wheeled models are easily moved by one man unassisted, even when the burner is in operation. An entirely new size, suitable for hand carrying, is the No. 66 Red Dot furnace, claimed to melt 50 lbs. of lead in 9 minutes. Can be used on small jobs or maintenance work in shop, yard or field.

A lower-cost compression hydrant, "Murdock, Jr.", has been announced by the 100-year old firm of Murdock Mfg. & Supply Co., Cincinnati 2, Ohio. This new hydrant is a non-freezing unit for use around mills, factories, parks, institutions, etc., where water is needed quickly in any weather. Made of Grade A bronze and grey iron castings, these hydrants are precision-machined and tested thoroughly before shipment. Water flow is controlled by a large ball wheel handle on top. (Lever will be supplied instead of handle if desired). It is non-freezing in any weather without previous attention and is recommended for fire service for large "Industrials."

This Machine Will Paint Curbs Quickly

Curbs can be painted quickly and at walking speeds with the curb painting attachment available for all line markers made by Universal Mfg. & Sales Co., 5211 Pacific Boulevard, Huntington Park, Calif. The attachment is adjustable to all curb heights and widths. Shields protect the street surface and lawn from paint spray. More from the manufacturer or circle No. 7-16 on the coupon.



Shields which attach to this marking machine simplify curb painting work

Two backfill tampers have been announced by Davy Compressor Co., Kent, Ohio. Model DT-32 (medium weight) weighs 35 lbs., length 47¼ ins. Model DT-42, designed to meet the requirements of operators for an extra hard-hitting tool, weighs 45 lbs., length 47¼ ins., body diameter 3¾ ins. and butt diameter, 6 ins. Many parts are interchangeable.

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TRAFFIC ENGINEER

The city of Corpus Christi, Texas, intends to create a traffic engineering division of the public works department. Traffic engineer needed to head this division. Starting salary $6132 annually, progressive increases. Must be registered engineer state of Texas or hold registration in another state that has reciprocal agreement with Texas and had at least 2 years' experience in responsible position in traffic engineering work.

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ASSISTANT ENGINEER,
C.E. or L.S.

Municipal public works department, New York metropolitan area. Responsible charge of field work and drafting room. Submit full statement of education, experience, etc.
BOX GC-7, PUBLIC WORKS MAGAZINE

Galion Ups Horsepower on Two Motor Grader Models

Diesel engine Galion Model 104 motor grader now supplies 93 hp at 1800 rpm

The Galion Model 118 motor grader is now supplied with a 125 hp GM or a 115 hp. IHC diesel engine. It is available with the B&L elevating grader attachment which provides a speedy, low cost method of casting, stripping, loading, and terracing. Also available is a creeper transmission which provides four extra-low speeds, three forward and one reverse, in addition to the regular six forward and two reverse speeds. Also Model 104 is now supplied with a GM diesel engine of 93 hp at 1800 rpm. Its weight ranges from 21,785 lbs. up, depending on extra equipment. The transmission has six overlapping forward and two reverse speeds, all of which are controlled by a single gear shift lever. Galion Iron Works & Mfg. Co., Galion, Ohio.

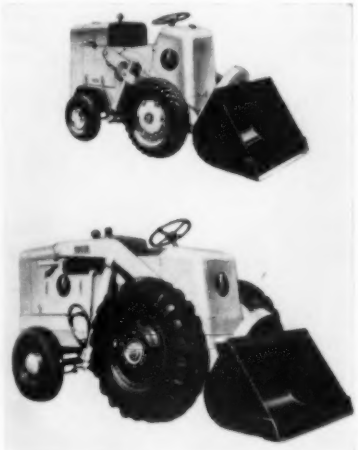
Shock absorber for elimination of water hammer in pipe lines. Due to the specially milled Flex-lastic insert and the compression molded tube in the steel shell of this shock absorber, the thrust and impact of the water entering the tube expands it against the insert until the energy caused by the pressure is dissipated. Available in sizes from ½ to 2 inch, they are leak-proof and cannot wear out. Josam Manufacturing Co., Dept. X35, Michigan City, Ind.

A portable oil fired steam cleaner, Model QSI, has been announced by Quick Charge, Inc., 1750 N.E. 10th St., Oklahoma City 4, Okla. This unit features completely automatic operation, the only control being two electric switches to start and stop the cleaner. Another feature is increased cleaning power of 120 lbs. pressure and 120 gals. per hour. Comparable models of higher capacity are available.

"Safe-T-Bar", a portable barrier especially designed for ease of transportation and handling, is now in production by Barmotive Products, Inc. It consists of three basic units: a hinged sign frame, a folding "A" leg assembly, and an adjustable height single leg, which can be put together quickly in any desired combination for single barricades, continuous barriers of any length, or enclosure barricades around manholes or excavations. Joints between sign frame units are articulated so that barrier can follow irregular lines; adjustable height single legs will accommodate uneven terrain. Height can be adjusted from 28" to 36". Compactness is a principal feature. Barmotive Products, Inc., 440 Peralta Ave., San Leandro, Calif.

New Hough Loaders Have Torque Converter Drives

New models of the Hough HA and HAH front-end shovel loaders have torque converter drives as standard equipment, and the HAH unit also has power steering. The



Hough shovel loaders use torque converters to give improved performance

HA has a struck load capacity of 12 cu. ft., the HAH of 18 cu. ft., but pay load capacity is one-third greater. More from Frank G. Hough Co., 761 Seventh St., Libertyville, Ill., or circle No. 7-17 on the coupon.

"Minipak", the new battery operated FM radio unit, has been designed and engineered for forestry people, construction crews, survey parties or any organization needing extremely light weight but reliable communication equipment. Weight 8 lbs., complete with batteries and 2 channel transmitter-receiver, the batteries having a normal operating life of over 8 hours. The unit is supplied with a carrying case and a packstrap, the removable whip antenna folding up into the carrying case. Radio Specialty Manufacturing Co., Portland 14, Oregon.

"Cifon, N. Y." is a highly effective deodorant that controls odors emanating from the handling of raw sewage sludge. Tests have proven that only 2 gals. of this product is required for every 9,000 gals. of raw sewage sludge to eliminate satisfactorily the foul odors. Sanitary Chemicals Dept., Fine Organics, Inc., 211 E. 19th St., New York 2, N. Y.

This Tracto-Loader Has Many Applications

Designed for excavating, backfilling, stockpiling and many other similar jobs, this TL-12 4-wheel drive rubber-tired loader has a 1-yd. bucket, weighs about 6 tons and has rear wheel power steering. For counties and cities, this unit is especially desirable because it is quickly moved from one job to another. The bucket can be dumped over truck sideboards 9 ft. 8 ins. high; reach varies with height of dumping. Standard equipment includes a lot of items. More from Tractomotive Corp., Deerfield, Ill., or circle No. 7-18 on the coupon.

Tractomotive Tracto-Loader has four speeds both ways

• • •

Personal Notes

James K. Pickard is now a consultant in atomic energy developments, with an office at 1518 K. St., N. W., Washington 5, D. C. Previously, Mr. Pickard was with the Atomic Energy Commission.

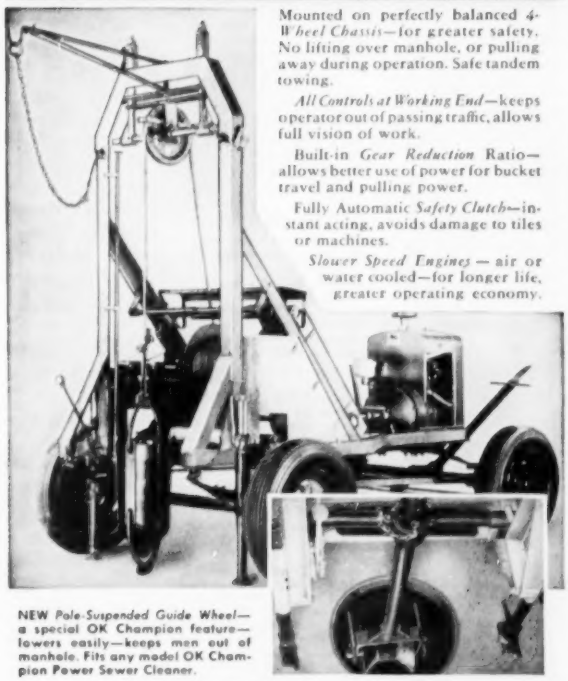
Dr. George E. Symons has been appointed, on a part-time basis, to coordinate the technical and administrative problems of the Research Division of New York University College of Engineering, specifically those relating to air and water pollution.

• • •

South Dakota Water & Sewage Conference

The 24th annual meeting of the So. Dak. Water and Sewage Conference will be held at the Lawler Hotel, Mitchell, Sept. 28-30. Details from C. E. Carl, State Sanitary Engineer, Pierre, S. D.

OK CHAMPION POWER SEWER CLEANERS



Mounted on perfectly balanced *4-Wheel Chassis*—for greater safety. No lifting over manhole, or pulling away during operation. Safe tandem towing.

All Controls at Working End—keeps operator out of passing traffic, allows full vision of work.

Built-in *Gear Reduction* Ratio—allows better use of power for bucket travel and pulling power.

Fully Automatic *Safety Clutch*—instant acting, avoids damage to tiles or machines.

Slower Speed Engines—air or water cooled—for longer life, greater operating economy.

NEW *Pole-Suspended Guide Wheel*—a special OK Champion feature—lowers easily—keeps men out of manhole. Fits any model OK Champion Power Sewer Cleaner.

Write for latest OK Champion Circular

CHAMPION CORPORATION • 4752 Sheffield Ave. • Hammond, Ind.

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(EARTH BORING MACHINE)

Designed for maximum control of the reamer. Earth along the pilot bits acts as a bearing to steady the reamer assuring an accurate hole.

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Please send, without obligation to me, the HYDRAUGER BOOKLET which shows relative costs and speeds of BORING as well as specifications of various Hydrauger models.

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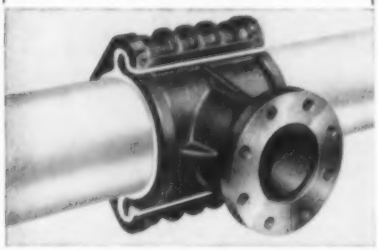
BOLTLESS

TAPPING SLEEVES



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Top economy in installation and maintenance because NO CAULKING NECESSARY — allows even unskilled workmen to do faster, better installations. LESS EXCAVATION and MORE WORKING AREA through new, simplified mounting process. Assured LIFE OF PIPE SERVICE.

QUALIFIED DEALERS AND DISTRIBUTORS WANTED IN KEY AREAS

Write for full information TODAY!

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FOR REPAIRING BELL AND SPIGOT JOINT LEAKS...

SKINNER-SEAL Bell Joint Clamp for stopping bell and spigot joint leaks under pressure. Gasket is completely sealed: at bell face by Monel Metal Seal band — at spigot by hard vulcanized gasket tip. 2" to 42".

AND BROKEN MAINS

SKINNER-SEAL Split Coupling Clamp. One man can install in 5 to 15 minutes. Gasket sealed by Monel band. Tested to 800 lbs. line pressure. A lasting repair. 2" to 24" incl.

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Worth Telling

(*More on next page*)

Miss Welder

★ Long of the opinion that this department needs brightening and beautifying, we submit this portrait of "Miss Welder of 1954." We still remember voting for movie star Sophie Loren (and all of her competitors, too) at Eutectic Welding Alloy's Flushing Long Island plant last fall.

★ Robert C. Gloppen is new sales manager of sewage treatment division, Yeomans Brothers Company, Melrose Park, Ill.

★ William L. Monroe becomes assistant to the sales manager, Dresser Manufacturing Division, Bradford, Pa.

★ Joseph A. (Joe) Lynch formerly advertising and sales promotion manager, Aeroil Products Company, South Hackensack, N.J., moves up to become exclusive warehouse distributor for Aeroil in all northern New Jersey. Joseph Halperin becomes vice president of Aeroil.

Mr. Bauer

★ H. G. Bauer succeeds W. A. Neumann as vice president and general sales manager, DeLaval Steam Turbine Co., Trenton, N. J. Mr. Bauer will assume supervision of all company sales activities. Previously he headed engineering and the marine division.

★ Open house for all Oliver Corporation distributors was held May 26 at their new branch plant in suburban Utica, N. Y.

★ Gledhill Road Machinery Company, Galion, Ohio, acquires M. A. Elliotte vacuum leaf loaders business *in toto;* formerly at Troy, N. Y.

★ Mountaineer: "Doc, I want you to look at my son in law. I shot him yesterday."
Doctor: "Shame on you, shooting your son in law."
Mountaineer: "Huh! He wasn't my son in law when I shot him."

● HERE is Caterpillar Tractor Company's main building at their new York, Pa., replacement parts plant. Our George E. Martin has recovered handsomely from Cat's marvelous hospitality during its May 19 opening ceremonies.

● "BUCKETS UP!" International-Hough material handling equipment thus acknowledges applause at close of great recent International Industrial Power Round Up held in true western style, at Phoenix Ariz.

● AS far as the eye can see: Pump assembly line in the new Fairbanks-Morse plant in Kansas City, Kan. Bob Shea, who represented PUBLIC WORKS at their open house ceremonies reports F-M as among the undoubted "hosts of the year."

Look to LEOPOLD
for the finest in
Water Purification
and Sewage Plant
Equipment

Glazed Tile
FILTER BOTTOMS

Permanent • No corrosion or tuberculation • Equal distribution • Low loss of head • Requires only small sized gravel • No metal in contact with water!

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"ELECTRONIC WITCH"

Pipe
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WORTH TELLING

by Arthur K. Akers

★ Neptune Meter Company sales expansions include appointment of Wentworth Smith as vice president in charge of sales, all divisions. John J. Carroll, of Louisville district office, succeeds him as general sales manager in New York. Walter K. Davies heads subsidiaries divisions sales.

★ M. J. Boho, vice president, sales, Hagan Corporation, Pittsburgh, has been named general manager, including Hall Laboratories and Calgon subsidiaries.

★ Pacific Flush Tank Company invited us to open house June 5th for their new eastern office in Port Chester, N. Y.

★ Buffalo Steel Division, H. K. Porter Company appoints R. M. Smith advertising and publicity manager.

★ We keep on happily reporting new Foxboro Company (instrumentation) branch factories. The latest is going up at San Leandro, Calif. The next will be Pittsburgh, Pa.

Mr. Dickey

★ Chicago Bridge and Iron Company will now fabricate all Conkey Filter equipment in their four plants. George Dickey, who is the "key" in Conkey, and H. M. Hunter, will move their New York offices to 165 Broadway. Milo E. Smith, advertising manager of Chicago Bridge, we hope to see back on the job soon after a long and needed rest in the South.

★ Old Friend Neal F. Harmon is new General Electric sales manager for 2-way radio equipment, in Syracuse.

★ Joe H. Serkowich, 1953 "National Advertising Man of the Year", becomes director of advertising and publicity for the whole Westinghouse Air Brake Company, moving to Pittsburgh from his LeTourneau-Westinghouse post in Peoria. Lloyd A. Rager succeeds him there.

★ Bernard E. Gray is succeeded July 1 as president of The Asphalt

Mr. Gray

Mr. Buchanan

Institute by J. E. Buchanan, now president of the University of Idaho. Col. Gray has a mighty pleasant retirement program mapped for himself, we hear.

★ Rodney F. Coltart is the new sales manager of Link-Belt Company's Central Pacific division at San Francisco. California golfers, beware! Also, Benjamin M. Prestholt assumes a similar post in the Southern Pacific division at Los Angeles.

★ Caterpillar Tractor Company wins the National Safety Council award for their ads. in general publications in the fight against automobile accidents. In them, like our columnist "Jack" Ritter, Caterpillar is "up front for adequate roads."

And, speaking of Caterpillar, our highway consultant George E. Martin reports a fine time was had by all at the recent opening ceremonies at their new parts plant in York, Pa. (See Worth Seeing in this issue for more.)

★ RCA Communications, Camden, N. J., names E. J. Hart microwave equipment sales manager. Five new district sales managers for microwave and mobile two-way radio are named, too.

(More on preceding page)

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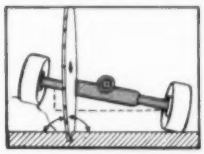
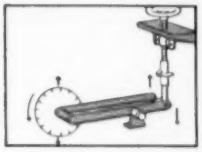
Perfect Combination for Joints — Trenches — Patches



Self-Propelled . . . and powered by 25 Horsepower . . . Clipper's new C-250 "ConSawMatic" cuts the MOST concrete for the LEAST cost per foot! Exclusive 3-Point Suspension on rugged 4-wheel chassis eliminates blade binding, reduces wear. Improved Screw Feed for **positive** Depth Control, essential with new GreenCon Abrasive Blades. Easy to handle, gets you "on the line" fast, ready to cut in a hurry. FREE TRIAL will show you why "4 Out Of 5 Buy Clipper".



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Savings you never dreamed of — as high as 80% with Clipper's new "GreenCon" Blades. Reinforced Abrasive Blades that knife through green concrete with limestone aggregate. Call or write Clipper today!

NEW Diamond Blades by Clipper — cut ANY concrete. There's new ease and speed in Clipper's **improved blade specifications** . . . for cutting green, cured or aged concrete. A blade for any job — any aggregate — every saw!

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DEPENDABLE in performance

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- DETROIT
- AUSTIN, TEX.
- CHICAGO
- LOS ANGELES
- HARTFORD
- BOSTON
- HOUSTON
- MILWAUKEE
- ST. PAUL
- INDIANAPOLIS
- NEW YORK
- PITTSBURGH
- DENVER
- NEW ORLEANS
- SAN FRANCISCO
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ODORS!

Odors reduce the efficiency and availability of sewage plant personnel—usually mean septic sewage—and cause complaints by nearby residents.

Strike back effectively and economically at this sewage plant nuisance with a dependable W&T Chlorinator. Chlorination kills the bacteria which cause odors.

Don't suffer through the rest of the season. See your W&T Representative now.

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A glance shows that the unit is operating properly.

Feed Rate Indicator has logrithmic scale

Percentage accuracy of feed same throughout range of chlorinator.

Rugged construction

Built to withstand the corrosive atmosphere of sewage plants.

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Methods of chlorinator control include manual, semi-automatic, rate, program and fully automatic.

S-85

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